Vol. XXIV JUNE 1930 No. 6

The EXCAVATING ENGINEER

IN THIS ISSUE:

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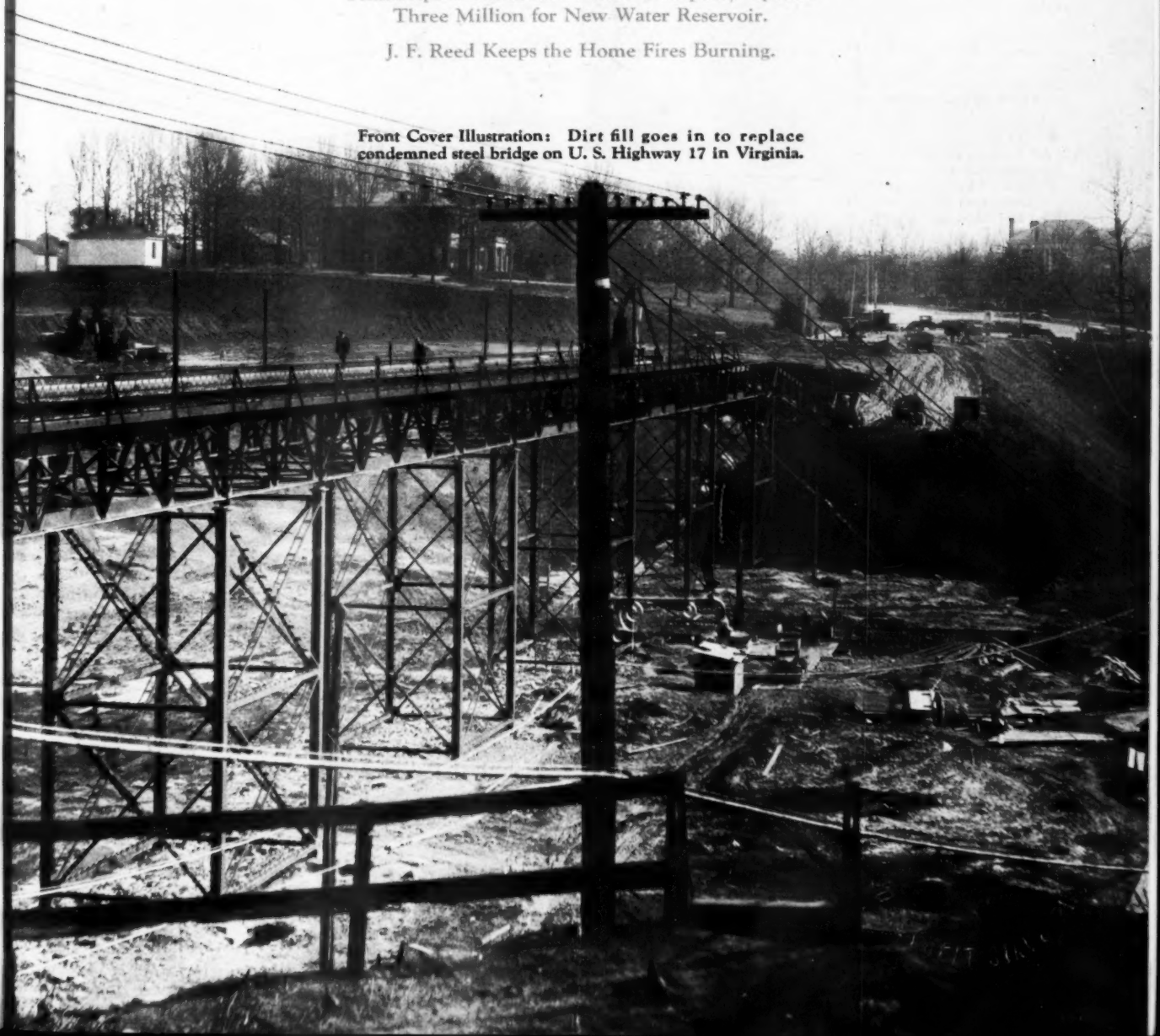


Front Cover Illustration: Dirt fill goes in to replace condemned steel bridge on U. S. Highway 17 in Virginia.

WHY THE 1020 GIVES YOU MORE FOR YOUR MONEY!

All the operating machinery is back of the center pin—giving the crane an extra margin of counterbalance for heavy lifting. Also, as a shovel, more stability in hard digging.

Tapered drums prevent fouling of cable—the cable winds smoothly and lays up evenly, outside to center. The taper also gives greater power at the start—then increased speed.

Note how these drums are split at the center for easy removal.

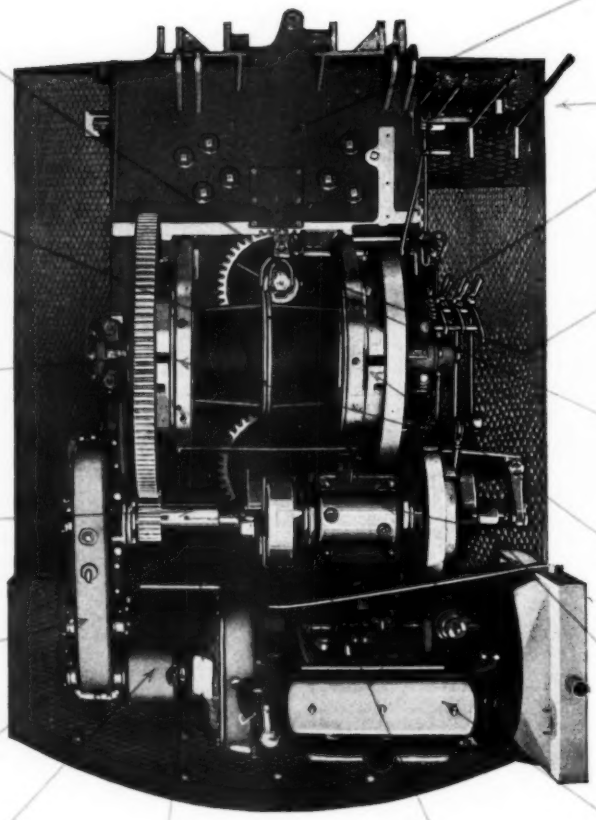
Contracting-band hoist control clutch engaged by means of auxiliary clutch — *lightens the operator's work for speedier operation.*

All shafts are greatly oversize—and every shaft above the deck runs on ball bearings. Double ball bearings on vertical take-off swing shaft. Also on fan shaft.

Transmission running in oil — keeping the oil at correct level gives complete lubrication of all power take-off shafts.

Clear deck all the way around the machine, on both sides and rear—giving complete accessibility to the machinery.

Flexible couplings between motor shaft and transmission—act as shock-absorbers, taking up any strain between these units.



Boom hoist — alloy steel machine-cut worm, and bronze machine-cut wheel, recessed in the revolving frame and running in oil.

Reversing clutches for the swing are greatly oversize — and a large brake is provided for use when the machine is on a grade.

One-piece steel turntable casting provides a rigid base for machinery—keeps all parts in *permanent alignment.* The same type of steel casting is used for the one-piece truck frame.

BUCYRUS-ERIE three-lever control.

Convenient controls for the operator — with handy push-button electric starter for the motor at reasonable extra charge.

Steering control rod runs through the center shaft, which permits complete steering control with the cab in any position.

Center shaft is adjustable from the top, and can be removed without interfering with drum shaft.

Oversize contracting-band hoist clutch and brake, with extra large wearing surfaces that insure long trouble-proof service.

Swing gears held in positive alignment by a box housing, and run in oil.

High horsepower motor gives this *BUCYRUS-ERIE* surplus power. Equipped with vacuum gas feed, air cleaner, automatic throw-out on starter. (Extra.)

A glance tells the story! Every arrow points to an outstanding feature. And taken as a whole they mean that the Bucyrus-Erie 1020 is not just another half yard rig but is a ½-yard machine with real guts! . . . From base to boom sheave every part is built to stand the gaff of steady hard work. Speedy, powerful and dependable is a short-story description of the 1020. Designed for easy accessibility, real mobility and simplicity of control, it gains your respect and regard at once. And because it is Bucyrus-Erie built, you know that operating and maintenance costs are at a minimum.

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manufacturers of the only complete line—all sizes, types and powers. *Plants:* South Milwaukee, Wis., Erie, Pa., Evansville, Ind. *General Offices:* South Milwaukee, Wis.

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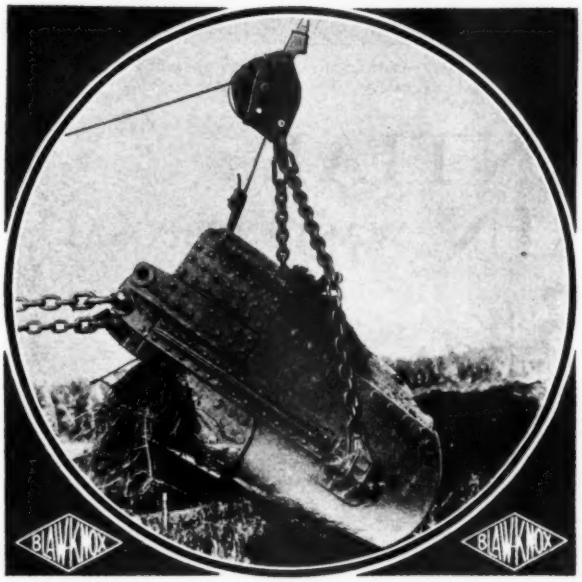

28 standard and many special sizes to give you the right one for your job. Light, medium and heavyweight designs—all sturdily built to anticipate the toughest jobs they may encounter. Teeth and lips are made from high quality manganese steel, highly resistant to abrasion—sidewalls are liberally reinforced and do not pull in. Consider the superior qualities of these buckets now—they have proved themselves wherever draglines are used. Ask for Catalog Form No. 1158.

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The Excavating Engineer

About Excavating Projects—By Excavating Men—For Excavating Men—The World Over

25 Cents Per Copy — One Dollar Per Year

Vol. 24 — JUNE 1930 — No. 6

CONTENTS

Articles

Irrigating the Loess Deserts of Turkestan..... 277
Sprecht & O'Neil Introduce Full Mechanization to Texas Road Building..... 280
Philadelphia Suburban Water Company Spends Three Million for New Water Reservoir..... 282
J. F. Reed Keeps the Home Fires Burning!..... 284
St. Louis Spends $4,000,000 for Water Works Improvements 287
A Request 287
Unique Shot Pulls Quarter Million Tons of Stone Off Top of High Dyer Quarry Face..... 287
Boulder Dam 287

Editorials

The Business Situation..... 288
William F. Callahan..... 289
Road Building Increase Accelerates Business Development 289

Equipment You Ought to Know About

New Redi-Prime Centrifugal Pump..... 291
Gear-Operated Bulldozer 291
Improved Blasting Machine..... 291

Shots from the Firing Line

Operator Dumond Saves Truck from Bad Spill..... 292
350,000 Yards New York Subway Rock Excavated in Six Months 292
45,000,000 Pounds of Construction Explosives Used in United States in 1929 and More Expected for Year 1930 292
Auto Caravan to Test Section of Proposed International Highway Into Alaska..... 292
Plenty of Work Ahead for the Roadbuilders..... 293
Canada 293
New England Notes..... 293
Eastern Notes 293
New York Notes..... 294
Pennsylvania Notes 296
Pittsburgh and Vicinity..... 298
Illinois Notes 304
Mesaba Range Notes..... 304
St. Louis and Vicinity..... 306
Texas Notes 306
Southern Notes 308
Wisconsin Notes 308
San Francisco and Vicinity..... 308

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Extending the dump laterally and longitudinally at the same time.

All steel construction—one-man operation—complete safety—3-way automatic dumping.

DIFFERENTIAL
STOCK PILING TRAIN WASTE DISPOSAL

DUMPS 3 WAYS

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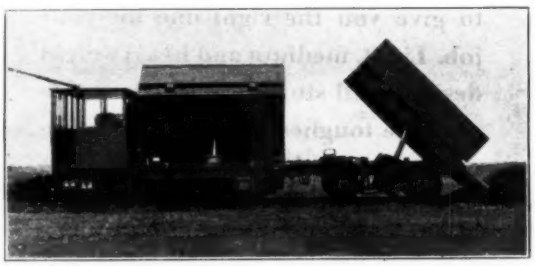
are supplied with electric drive, taking current from trolley wire or third rail. Also supplied as self-contained unit with gas-electric or Diesel-electric drives. Level load capacity of dumping bodies 10 yards each. Length of train may be varied to suit operating conditions. Send for our illustrated bulletin D-29.



By pushing car ahead in dump position, door may be used as spreader when extending dump longitudinally.

The Differential Steel Car Company has equipment that will fit your job. Send us the details of your haulage problems and we will be glad to make recommendations and furnish you unit costs of operation.

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THE DIFFERENTIAL STEEL CAR CO.
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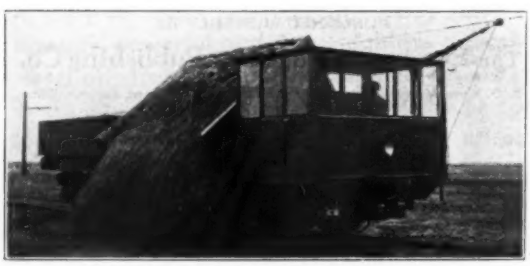
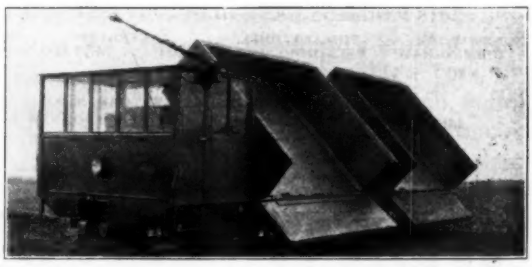


Note how load is cast well away from track.



Steep dumping angle, smooth floor and clear discharge opening.

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2,000 HOURS of HEAVY WORK

and no time lost for repairs

TWELVE months ago Platte County, Mo., added a Cletrac to the county's equipment. It was a Cletrac "40"—famous for power and dependability. One of its first jobs was grading and dragging 120 miles of roadway. Within one year's time this rugged Cletrac rolled up a total of 2000 working hours and no time lost for repairs.

Such performance is typical of Cletracs. Inbuilt stamina is one of their strongest characteristics. They have proved their ability to stay on the job day after day and month after month—to keep going without loss of time for adjustments or repairs. That is the kind of service Cletracs are giving to thousands of satisfied users.

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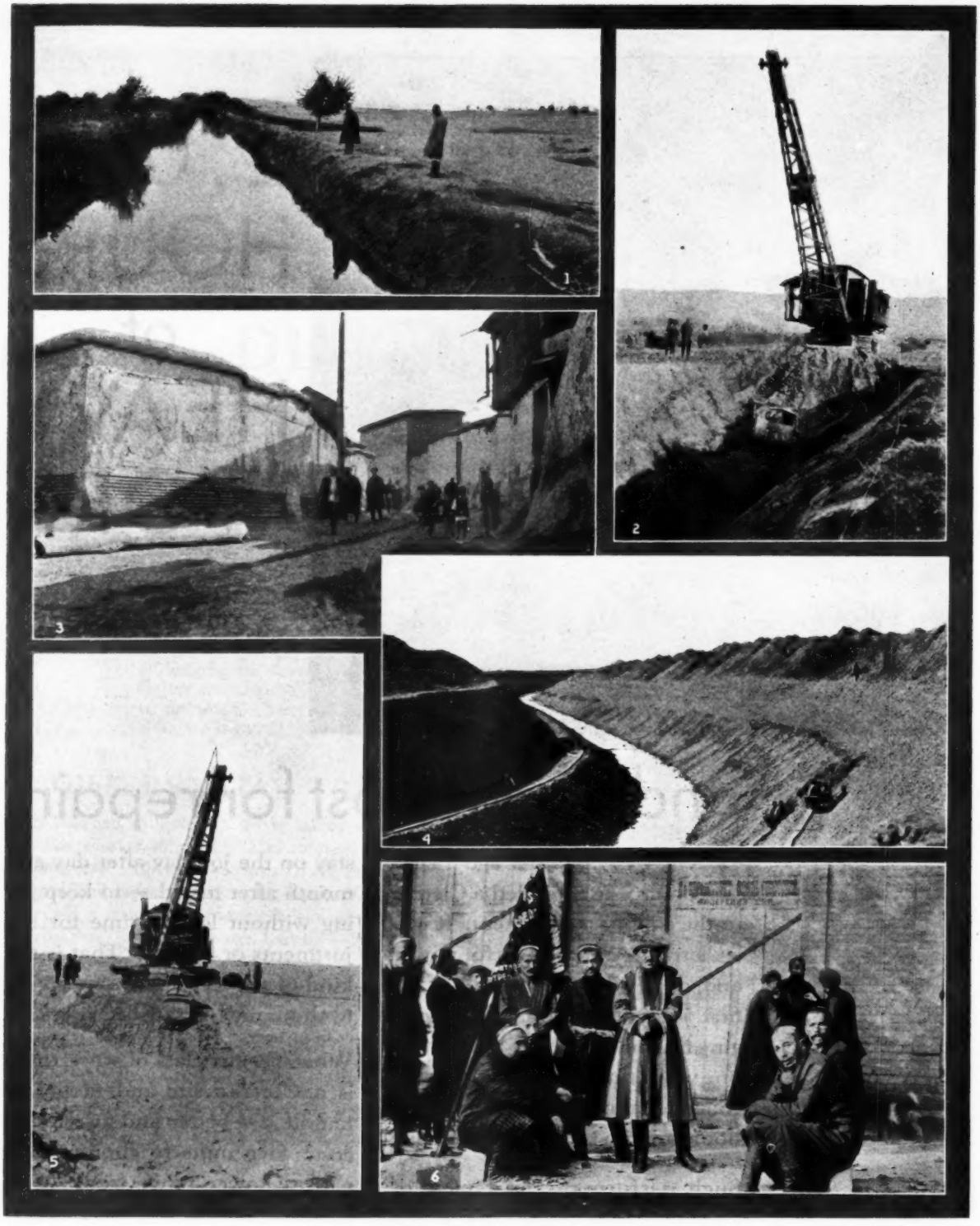

With Camera in Turkestan

(1) One of the old canals in the Fergana district which will be cleaned and widened as the new program goes forward.

(2) Making initial cut for one of the distributary canals with Bucyrus-Erie 50-B dragline.

(3) Typical native street in Tashkent. The houses of mixed clay, straw and camels' dung, blend with yellowish grey of street and sky, contrasting with the gay colors of the halats (coats) and caps of the populace. Windows of houses open inside to the court, while bare back walls are on the streets.

(4) Dalverzinstroy delivery canal dug by Bucyrus-Erie Class-14. The sides are trimmed by hand, and material removed with wheelbarrows in preparation for concreting the bottom and sides. Concrete lining is used only on the delivery canal.

(5) Pumping oil to dragline tank from drum, in which fuel is brought via industrial railroad and team-drawn carts.

(6) Typical group of Uzbecki gathered to take part in a Soviet demonstration at Namangan. The brilliant colors of the costumes, we are, of course, unable to reproduce.

The EXCAVATING ENGINEER

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Irrigating the Loess Deserts of Turkestan

As far as the eye can see stretches an unlimited level plain of loess desert.

Union of Soviet Socialistic Republics adding 1,000,000 acres of fertile fields to increase production of cotton and other crops in this rich but little-known region of Middle Asia.

◆ ◆ ◆

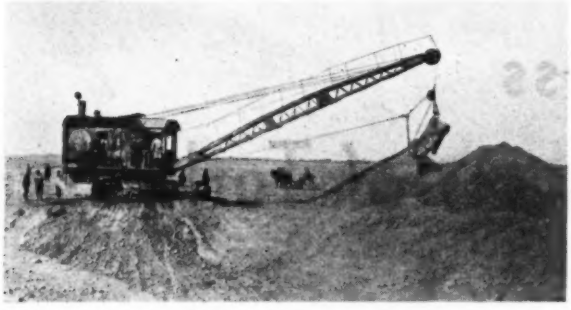
ONE of the many great projects now being rushed to completion of the Union of Soviet Socialistic Republics of Russia in their famous Five-Year Program is the large irrigation works on the River Syr Daria in Turkestan. Sredasvodhos, the Middle-Asia Water Department of the Union of Soviet Socialistic Republics, has already well under way a network of canals near Tashkent on the east banks of the Syr Daria which are opening for cultivation a large acreage of extremely fertile country splendidly suited for growing of cotton as well as grain, fruit and other farm products.

In the days of Imperial Russia some futile scratches were made in the direction of bringing water to the exceedingly rich plains of the Syr Daria and Amu-Daria, two great rivers flowing swiftly down from the Thian Mountains and Panier Plateau and across the plains of this richest country of Middle Asia to the Aral Sea. Along these rivers and their old canals flourish cotton fields, vineyards, orchards and melon patches. Silk, pepper, grain and the tall pampas grass from which is made baskets and mats are also produced in this territory. Camels abound everywhere and the region is famous for the fine fleece of its sheep.

The inhabitants of this region are Uzbecki, a people of Aryan descent and Persian descent — and the Kirgiezy, a people of Mongolian stock and a living reminder of the fact that the Tartars conquered and ruled Russia for some 300 years.

Loess Plains of Dust Carried There by Winds

The formation of these plains is a most interesting one. The ground is called "loess" and is formed from wind-blown dust carried down from the nearby mountains. Unbelievable as it may seem, this fine, soft, grey or yellowish dust has



Russian engineers inspect one of the 50-B's in operation. Carriage in background used in inspection tours. In the distance on the horizon an oasis stretches along one of the old canals.

covered many hundreds of square miles, leveling the original irregular formation of the terrain into a vast plain. In some places exploration has shown the loess deposits to be seventy feet deep. In others, over higher points of the former surface, the dust may be only a few inches deep. Occasionally sand dunes lend the conventional desert atmosphere, but for mile on mile this vast plain

Close to Tashkent this waterfall has been formed in one of the old collector canals.

stretches out from the foothills an almost unbroken desert of loess. The magic of a touch of water brings it into bloom, a whip of wind sends its top layer up in vast clouds of suffocating grey fog. In summer the temperature across the loess desert is frequently 110 degrees in the shade, sometimes higher — the ground temperature in the sun often goes to 176 degrees Fahrenheit. Nights, however, are usually cool. For a short period in Winter and in Northern portions the temperature may fall considerably below zero.

Excavating Handled by Four Bucyrus-Erie Oil-Burning Steam Draglines Presents Unusual Difficulties

Battling against these extreme difficulties of temperature, sifting dust that finds its way into everything, with water alkaline and muddy, with untrained machine operators, and a new organization to weld together, equip and supply, the Russian engineers of Sredasvodhos have already made remarkable progress on this great project, which in its entirety will involve the excavation of millions of yards in construction of canals and barrages.

The present work which is on the Dalverzian Canal system is being put through with two Bucyrus-Erie 50-B, a Bucyrus-Erie Class-7 and a Bucyrus-Erie Class-14, all oil-burning steam draglines.

The main Dalverzian Canal is 23 kilometers (14.29 miles) in length, with left and right main branches respectively 45 kilometers (27.96 miles) and 24 kilometers (14.91 miles) in length. The

Converted Fordsons pull the trains on Industrial Railway, handling supplies, crews, and engineering parties.

main canal is 10 meters (32.8 feet) wide in the bottom and from 3½ to 4 meters (11.48 to 13.12 feet) deep, with slopes of 1 to 1 and 1 to 1½ according to the material.

Bucket Teeth Bite Into Hard Digging Below the Loess

Part of the digging is very easy, as the loess itself is an easy rich soil to excavate. However, the canals generally go down into the underlying strata, which is largely a very hard, yellow-gray clay. This can be broken with difficulty with a pick, but in some places not even in this manner. Fortunately the clay is in strata, and by getting the bucket teeth under a layer the draglines can break it up. For most economical digging operation it should be blasted, but because of the high cost of powder in this out-of-the-way region, the

(1) Market place at Tashkent — a conglomeration of Uzbecki, Kirgiezy, camels and horses. The odor cannot be transmitted in a photograph.

(2) Camel caravans bring the cotton to warehouses of Namangan of Fergana District.

(3) Along the banks of the river Syr Daria near the entrance to the Dalverzinstroy Canal. At the right you can see ruins of a clay palace, once home of ancient rulers.

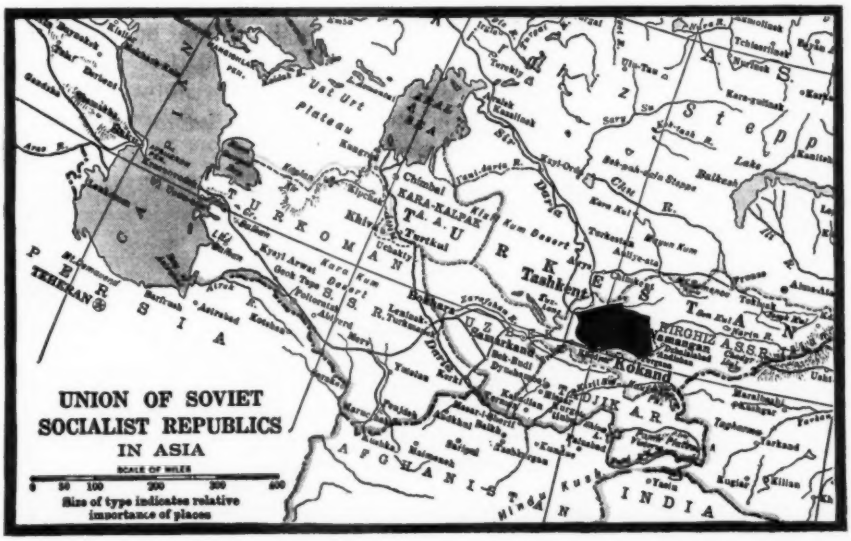
(4) Last picking of cotton crop in the Dalverzin Valley. Large acreages in the newly irrigated district will be devoted to this crop. Note woman at right wearing black horse-hair veil over her face. This ancient custom of the region handed down from medieval times, is being combated by the Union of Soviet Socialistic Republics.

machines dig without shooting. Special diamond-shaped teeth points of Russian manufacture are used. In places a shingle formation containing stones of all sizes up to 9 or 10 inches is encountered, this also being dug without blasting.

In spite of the many handicaps, including the continual dust sifting over and into machinery, and the frequent dust storms which prove a handicap to operators as well as machines, the draglines have stood up to the task remarkably well, and have attained some very excellent outputs, all things considered.

Hourly Output of 1½-yard Draglines as High as 157 Cubic Yards

In the ten months preceding the writer's visit, the 50-B's excavated 3½ kilometers (2.7 miles) of canal with bottom width of 6½ meters (21.32 feet) and average depth of 4 meters (13.12 feet), 9.2 kilometers (5.72 miles) of canal with bottom width of 10 meters (32.8 feet) depth of 4 meters (13.12 feet), and 15 kilometers (9.32 miles) of canal with bottom width 5 meters (16.40 feet) and depth of 4½ meters (14.76 feet). These machines are equipped with 1½-yard buckets and 45-foot booms. They work three shifts of 8 hours each. Over the period of 10 months the carefully-kept records show their actual digging time as 76 per cent of possible hours, the remaining 24 per cent being charged to moving, weather, refueling, oiling, maintenance and repairs.



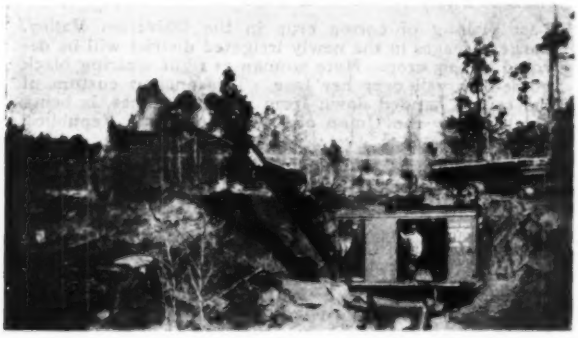
Solid blue area indicates the extent of this vast reclamation project in Turkestan.

(Continued on page 310.)

Sprecht & O'Neil Introduce Full Mechanization to Texas Road Building

Production Efficiency and daily cost record show results in production of their Diesel + Air

ONE of the show jobs of Texas road building is now being put through by Sprecht & O'Neil on the new State Highway No. 106 between Carmona and Woodville. On this twenty-six-mile piece of new road grade which gives a straighter and better highway between these points there is 400,000 cubic yards of excavation through earth, sand and hardpan. The latest types of equipment are being used, while efficient production methods and cost records make the job a model other Texas contractors are watching with keen interest.



Operator Munyon shows us what a full dipper looks like. Stump in the foreground is typical of those removed by the shovel without blasting.

The right-of-way runs through timbered country, with a fairly heavy growth of pine, with trunks averaging about one foot in diameter. Clearing consists of cutting this timber, leaving the stumps to be taken out and bunched by the shovel. A Bucyrus-Erie DA-2 is doing the digging and removing these stumps very successfully without use of dynamite.

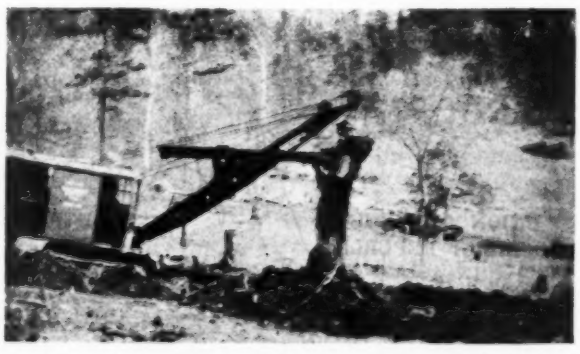
Entire Organization Enthusiastic Over Diesel + Air Performance and Economy

The grade has a 30-foot crown, with slopes on the fills varying from two-to-one to eight-to-one, depending on the depth and material as judged by the state engineers. For the present the road is to be used as a dirt highway, though later as traffic demands and finances permit it will be paved. Construction is planned with this future paving in mind.

The work of the Diesel + Air is being checked with considerable interest, as this is a new type of machine to Texas road builders. Sprecht & O'Neil are certainly most enthusiastic about the shovel and operator J. D. Munyon claims it's the world's best. To quote the words of Mr. O'Neil "She's one *real* machine!"

1048 Cubic Yards Loaded in Four Hours Twenty Minutes

J. D. Munyon is, by-the-way, one of the top-notchers in his line. He puts the DA-2 through her paces with a speed and smoothness that gladdens the heart of any experienced dirt mover, and if she was his own child he couldn't do much more to keep her looking clean and pretty. Operator Munyon was an old steam man, and this is his first adventure on the more modern type of road-building machines. That it didn't take him long to get the hang of the new rigs is evidenced by production figures, which show 1360 yards loaded in ten hours on his first day out (March 15th), 1140 yards in 8½ hours on the next day (Sunday) and 1464 yards in 10 hours on the third day. While we were looking over the job he heaped high 131 of those big 7-yard Westerns in four hours and twenty minutes — from 7 a. m. to 11:20 a. m. Figuring 8 yards to a load, and if ever one of those Westerns carried 8 yards they did that day, that figures out 1048 yards in considerably less than half a day, and that's something for any operator on a 1¼-yard shovel to shoot at.



Casting with the Bucyrus-Erie DA-2 in one of the lighter cuts.

Mr. O'Neil tells us he's getting 1800 to 2000 cubic yards per 10-hour shift, and with some extra wagons to keep the machine hustling steadily he hopes to get more. At present the hauling is being done with six Caterpillar Sixty's hauling six 7-yard Westerns. Eight more big Westerns are coming, however, and as soon as these arrive two-wagon trains will be used to serve the shovel where hauling conditions are at all favorable. It takes six heaping dippers to fill the wagons to capacity, the digging being particularly favorable to piling high in both dipper and wagon. Mr. Sprecht, who is looking after the carefully-kept daily cost records and production figures, commented that between 8 and 9 cubic yards per wagon checks out closely with the engineer's estimate and profile figures.

Mr. Sprecht and his son inspect the operations of the Diesel + Air.

Expect to Finish Job in Record Time

Work was started March 15th, and 300 days is allowed for completion. With clear weather undoubtedly on the boards from May 1st to December 1st, Sprecht & O'Neil feel quite sure that they'll be nicely through in a little more than half of the time allowed.

Both members of the firm are living with their families at Carrigan, where they can be right on the job all the time. No camps are required, as the work is mechanized as far as possible, and the small crew required lives or boards in Carrigan.

Finishing is done with a Caterpillar and grader, and some of the light cuts will be handled with an elevating grader. Some of the tag end jobs are cleaned up with mules and fresnos.

While the possibility of operating two or three shifts with a full mechanical outfit such as they are using is fully realized, Sprecht and O'Neil do not believe that this can be handled as profitably as a single shift by their organization. In case of a special need for increased production they are ready to speed up with the extra shift, but where time is not a problem they prefer to work one ten-hour shift.

In starting one of the first heavy cuts just out of Carrigan the first fill to the Carrigan end of the cut went into a low piece of land that went soft in the Spring rains. The dirt went about half to this dump and half was called for in a gully at the opposite end of the cut. The break into this gully was a stiff one, and in order to get their dirt onto this dry dump an extra Caterpillar was put at the top of the hill to help let the loads down to the foot of the hill on a chain, and to give the "Cat" and the empty a lift up after the load was dumped. It will take three cuts through to finish the grade, and after the first or box cut is put through the hauling equipment will be run both ways from the shovel, hauling alternate trips to first one dump and then the other, thus avoiding the turn around at the shovel.

Caterpillar Tractors Haul Heavy Loaded Westerns Through Tough Going

The Caterpillar Sixty's have proved their ability to take the Westerns with their Athey Truss mounting through most any kind of going on the job, and some of the mud has been nasty stuff. Hauls average about 600 feet, with overhaul on everything over 200 feet.

Sprecht & O'Neil are bidding on a number of other Texas road jobs, and if all their jobs are handled as efficiently as the present one, they will soon earn a place among the most successful of Southwest contractors.

General view of operations showing Crum Creek in the foreground. Trucks, Iron Mules and heavy-duty trailers are being used to haul from the Gas + Airs.

Philadelphia Suburban Water Company

American Pipe and Construction Company builds dam to form 400-acre lake for new water reservoir.

Spends Three Million

TO keep pace with the fast growing district around Philadelphia, the water resources of the Philadelphia Suburban Water Company are being enlarged by the construction of a $3,000,000 dam and storage reservoir near Media, the county seat of Delaware County, on Crum Creek. The dam, two thousand feet long, eighty feet above the valley floor, will store about four billion gallons of water and form a four-hundred-acre lake.

740,000 Cubic Yards Excavation

The work, contracted for by the American Pipe and Construction Company, Harry W. De Graff, Manager, of Philadelphia and Amsterdam, New York, includes 650,000 cubic yards of earth excavation and embankments, 90,000 cubic yards of rock excavation, and 30,000 cubic yards of concrete. The dam will be completed in 1931.

Work was continued through the winter with two Bucyrus-Erie Gas + Air 1¼-yard high lift shovels and one Type B Bucyrus-Erie shovel and crane. The GA-2's are equipped for converting to clamshell and dragline operation.

The core wall trench for the foundation of the dam cuts through solid rock. When the Bucyrus-Erie Gas + Air and B-2 have finished their work the dam will rise here 80 feet above the valley floor with a 40-foot roadway running along the top.

Shovels Root Out Stumps and Trees

The dam site was first stripped of overlying loose material, with the Gas + Air machines loading into La Plant-Choate and Western seven-yard crawler wagons drawn by Caterpillar "Sixtys." The material was wasted at the upstream toe of the dam in cofferdams and at the downstream heel in permanent spoil areas. The GA-2's were particularly effective in rooting out large stumps and traveling the steep slopes of the valley.

Large Rock Saved for Facing

The Gas + Air's are, at this writing, being operated in the stream control conduit and core wall trench, one as a shovel, and the second as a clamshell and dragline. Rock and boulders weighing upward of two tons are removed from the trench by the clamshell and stored for future use in the slope protection of the dam. The shovel with its high lift boom excavates the trenches to rock, loading into the crawler wagons on the bank.

The operators of the shovels, Andy Manz and William Murphy, are mighty enthusiastic about their machines.

Loading a Hughes-Keenan "Iron Mule" as the Gas + Air presses close on the heels of the clearing gang.

Plans for the project were made by H. R. S. McCurdy, Chief Engineer for the Philadelphia Suburban Water Company of which C. E. Davis is manager.

The execution of the contract work is under the personal supervision of H. W. De Graff, Manager of the American Pipe and Construction Company, with Bunyan Coleman and Edward Laval as Field Superintendents.

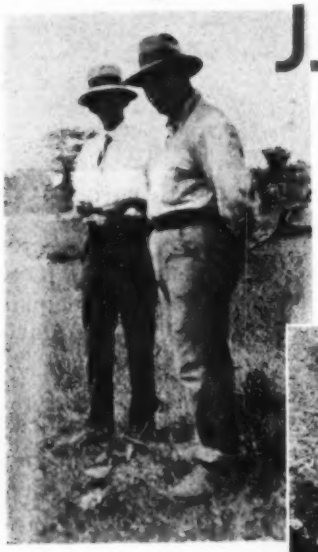
Cutting diversion channel to carry Crum Creek while north end of dam is being constructed. Note the stumps thrown out by the Gas + Air at the lower left.

Approximately 100,000 tons of coal available in the Reed pit.

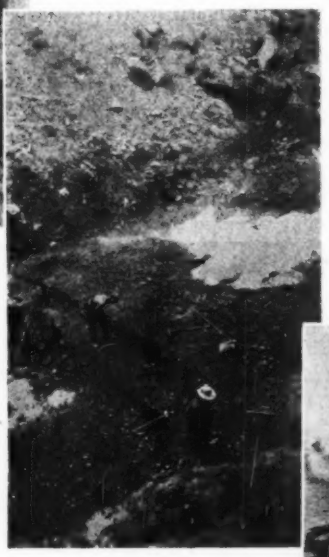
J. F. REED Keeps the Home Fires Burning!

J. F. REED & SONS COAL COMPANY, down in Fulton, Missouri, mines coal on the outskirts of town by the usual methods of small open pit operation. But they find their market problem simplified because their entire output goes to keep the Fulton home fires burning. Fulton coal is a home product from mining to burning.

There are approximately 100,000 tons of coal available in the Reed pit. Operations are carried on steadily throughout the entire 365 days of the year on one eleven to twelve-hour shift, and the average daily production amounts to over 50 tons.



Above: J. F. Reed at the right with D. P. Moore of Oleney, Illinois.



Right: Mining the coal seam a hand operation.

Bucyrus-Erie Digs 18 to 30 Feet Overburden

Overburden ranges from 18 to 30 feet, and is composed of rock, shale and clay in the following proportions: rock 5%, shale 30%, with the remaining 65% clay. The rock ledge formation is found near the top of the ground, and runs about five to six feet in thickness. The shale formation lies beneath the rock, and from this shale down to the coal deposit the overburden is clay. The upper ledge rock is drilled and shot with dynamite, but the shale is removed without shooting.

Stripping is handled by a Bucyrus-Erie 50-B steam machine. At the time the pictures were taken, the machine was digging in 30 feet of overburden, while a Marion Type 7 steam machine, located on top of the spoil pile, rehandled the overburden, which was too deep at this point to permit handling with a single machine of 50-B size. The all-around performance of the 50-B, and especially its ability to stick with its load, even in the tough shale rock, has earned the admiration of the men at the Reed pit.

Left: Cleaning up after a spring flood.

Below: General view of the J. F. Reed pit.

Ditches Care for Usual Surface Water

The water pools shown in the illustrations are the remainder of a near flood, which at its worst rose to within three feet of the 50-B's cab top.

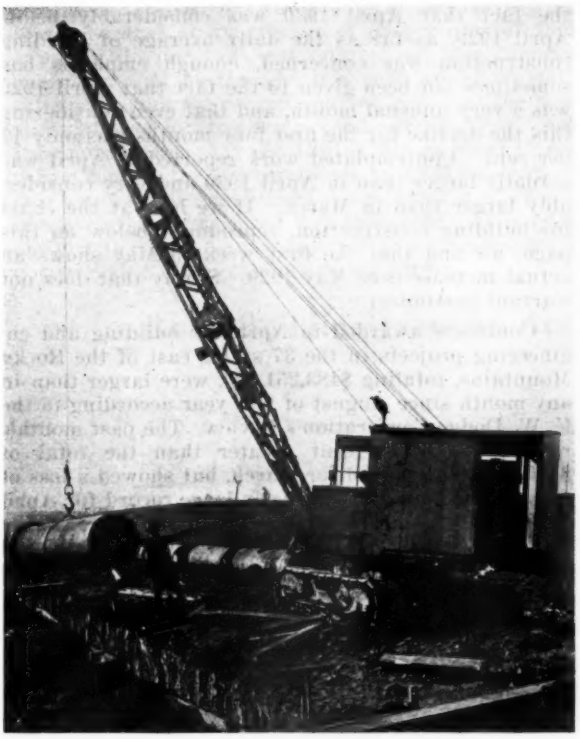
Ordinarily excellent drainage is provided by a small ditch running alongside the mine. When the overburden runs only 18 to 20 feet, the Marion shovel is used about the pit to maintain the drainage system.

Removal of overburden bares a clean coal vein, averaging 30 inches in thickness. The coal is pinned off and loaded into two-yard cars by hand labor. These cars, running on a narrow-gauge track, are pushed by hand out of the pit to a small tipple, electrically operated. From this tipple motor trucks are loaded and the coal is delivered direct to the customer.

St. Louis Spends $4,000,000 for Water Works Improvements

PICKING 'em up and laying 'em down for the City of St. Louis Water Department had a big part in the $4,000,000 Water Works Improvement program recently provided by the voters of St. Louis.

The accompanying illustration shows a Bucyrus-Erie Type 1030 crane working in close quarters, laying cast iron pipe between the street



6630 pounds of iron pipe going into place.

car tracks and the edge of Forest Park. The pipe on this job averaged from 4000 to 6630 pounds in weight and measured 12 feet in length and 36 inches in diameter. The 1030 laid 14 miles of water mains in this improvement program, reaching from Howard's Bend on the Missouri River to Kings Highway and Oakland.

A Request

The New York Public Library has asked us to attempt to secure copies of *The Excavating Engineer* November 1928 issue and the January 1929 issue. We are unable to supply these missing numbers for their files as our reserve on these months has been exhausted. If any of our readers have either or both of these copies which they can spare, the New York Public Library would be very grateful to receive them. They should be addressed to the *Director, New York Public Library, 5th Avenue at 42nd Street, New York, N. Y.*

Unique Shot Pulls Quarter Million Tons of Stone Off Top of High Dyer Quarry Face.

At noon, April 30th, in the Monocacy Quarry, two miles south of Birdsboro, Pennsylvania, General Manager Gucker of the John T. Dyer Quarry Company of Norristown, Pennsylvania, pressed the handle of a blasting battery. An instant later 250,000 tons of stone rose up from the bed where it had lain for countless centuries, shook itself, and fell back shattered and torn by 42,000 pounds of dynamite.

While the size of this shot does not make it unique, the laying out of hole was out of the ordinary. It was desired to bring down the top of the

quarry for about 370. feet. Two 50-foot "T" tunnels were run in about half way up the 280-foot face. As the foot path to these tunnels was too narrow to permit quick and safe transportation of the explosives for loading, it was handled by a derrick rigged on top of the quarry. In addition to the tunnels a well drill hole 90 feet deep was loaded to within 43 feet of the top with explosive, and shot simultaneously with the tunnel shot.

36,000 pounds of Du Pont 40 per cent Red Cross Extra in 7 x 24 cartridges was used, with 6,000 pounds of 60 per cent in the corners.

Boulder Dam

With President Hoover's request to Congress for an initial appropriation of $10,600,000 to commence construction of Boulder Dam at Black Canyon on the Colorado River, this great project takes another long step toward reality.

The City of Los Angeles, the Metropolitan Water District and Southern California Edison Company have signed contracts for 57% of the 650,000 horsepower to be generated. With this requirement fulfilled and assured repayment of the cost of the dam, over a 50-year period ($165,000,000 plus interest at 4%), it only needs prompt Congressional action to set the wheels in motion for the preliminary work on this gigantic construction project.

THE EXCAVATING ENGINEER

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The Business Situation

IT'S all too easy today, to sit back and look at the indicators which to some extent forecast the business of the immediate future and decide that present conditions warrant pessimism. Business activity today is below that of a year ago, but commerce, industry and agriculture are not a uniform structure. Certain branches of industry develop faster than others and constant adjustment is necessary. It is practically never true that all groups of human activity are properly geared together like the parts of a machine. Raw materials may show an overproduction. Agriculture may build up too great a carryover of product. One industry may, in response to a very active demand, over-reach itself in supplying this demand. Then must come a period of reaction to bring the various factors or divisions back into a more nearly correct ratio of activity or output.

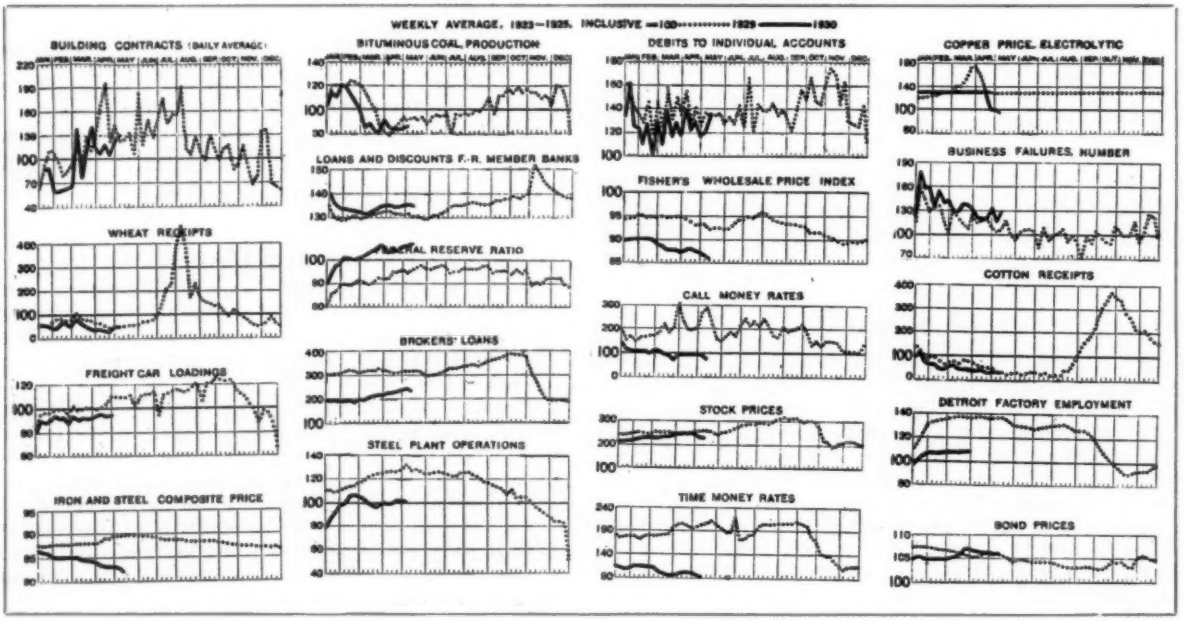
It is obvious that is what business is doing today. Over-speculation last year raised money rates sufficiently to throw many an industry out of gear and precipitated a period of readjustment. Let us look at the fundamental conditions and the indicators that foretell not only of tomorrow but of the day after. Money rates which seem to have precipitated the present readjustment are low — below the average of 1923 to 1925 — a condition which in previous periods of readjustment has been the advance agent of improvement.

In our own industry — and construction activity is considered one of the basic and best indicators of future activity — we have another promising situation. While there has been considerable comment on the fact that April 1930 was considerably below April 1929, as far as the daily average of building construction was concerned, enough emphasis has sometimes not been given to the fact that April 1929 was a very unusual month, and that even considering this the decline for the first four months was only 17 per cent. Contemplated work reported in April was actually larger than in April 1929 and very considerably larger than in March. If we look at the chart for building construction, reproduced below on this page, we find that the first week in May shows an actual increase over May 1929. Surely that does not warrant pessimism.

Contracts awarded in April for building and engineering projects in the 37 states east of the Rocky Mountains, totaling $483,251,700, were larger than in any month since August of last year according to the F. W. Dodge Corporation's Review. The past month's record was 6 per cent greater than the total of $456,119,000 reported for March, but showed a loss of 25 per cent from the unusually large record for April 1929. For the first four months of the year awards totaled $1,580,398,900 as compared with $1,897,889,800 for the corresponding period of 1929, a decline of 17 per cent.

Public works and utilities for the fourth consecu-

WEEKLY BUSINESS INDICATORS



tive month were the most important of all classes. This type of construction totaled $149,669,900 or 31 per cent of the total awards in April. Residential building totaled $123,141,900 or 25 per cent of the total; awards for commercial structures amounted to $73,241,100 or 15 per cent; and new contracts for industrial buildings aggregated $38,120,600 or 8 per cent.

Contemplated new work of all kinds reported in April amounted to $954,617,400 compared with $732,735,900 in March and $940,249,100 for April 1929.

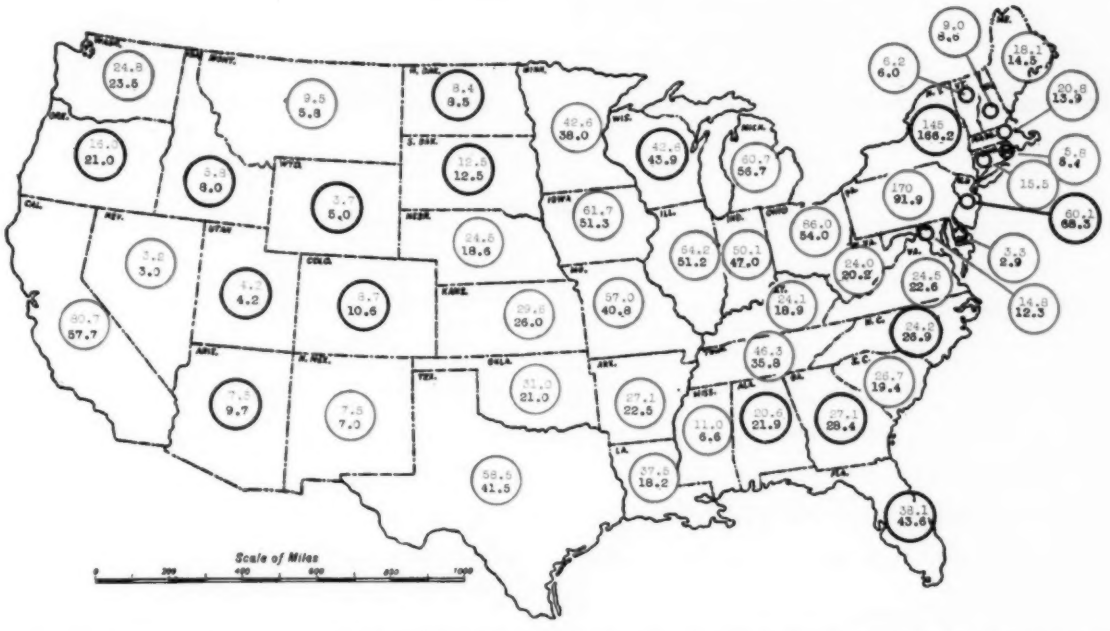
Steel plant operations is another significant indicator. At the annual meeting of the United States Steel Corporation, held on April 21, James A. Farrell, President, stated that the plants of the corporation were operated at an average of 82 per cent of their capacity during the first quarter of this calendar year, and that he thought this rate would be maintained through the second quarter, and that the management was looking for a good average year. And it is noteworthy that the United States Steel Corporation budget for improvements in 1930 amounts to two hundred million dollars — an increase of 75 million over the figure given last December. It is quite obvious that the management of this corporation is not worrying about the immediate future.

William F. Callahan

On April 29th, 1930, in his home in Hollywood, California, William F. Callahan passed away. 73 years of age, he had spent all of his life in the contracting industry. He was born in Ottumwa, Iowa, and was a pioneer railroad contractor on the Union Pacific, Milwaukee, Rock Island and Burlington lines. He was the founder of the Callahan-Walker Construction Company of Omaha and was Vice-President of this organization at the time of his death. He brought up his boys to follow in his footsteps as a contractor. He was the father of W. E. Callahan of the W. E. Callahan Construction Company, St. Louis, Missouri, and of Arthur and Fred Callahan of the Callahan Construction Company, Los Angeles, California. He is also survived by a brother, Ed Callahan of Los Angeles.

Many of the readers of *The Excavating Engineer* are counted among the many friends made by Mr. Callahan during his lifetime of dirt moving. We know that they will feel a keen sense of loss on learning of his passing, and that their sincere sympathy will go out with ours to his family and associates.

Road Building Increase Accelerates Business Improvement



The estimated state and local road-building expenditures in millions of dollars for 1930 are shown in red figures, compared with the 1929 estimates shown in black. Red circles (33 states) indicate that the 1930 estimates exceed the 1929 estimates. Based on figures released by the Bureau of Public Roads, United States Department of Agriculture.

"I am convinced that we have now passed the worst and, with continued unity of effort, we shall rapidly recover . . . We have for the first time attempted a great economic experiment . . . We have undertaken to stabilize economic forces . . . We have succeeded in maintaining confidence and courage . . . The acceleration of construction programs have been successful beyond our hopes." So spoke President Hoover at the annual meeting of the Chamber of Commerce of the United States.

Road-building is playing a prominent part in this stabilization of conditions by giving jobs to those who want to work, releasing funds in large volume to flow through all the buying channels of the nation and help speed the wheels of business. Secretary of Commerce Lamont recently announced that 35 states have reported to the Commerce Department an increase of 124 per cent in contracts for highway construction let during the first three months of 1930 as compared with the same period last year. Awards during this

(Continued on page 291.)

WHEN THE JOB IS DIFFICULT GET RESULTS WITH A LINN

Here the LINN is operating on a difficult highway fill in the Black Hills of South Dakota, for Chaulk and Birdsall, contractors

HAULS PAY LOAD AS IT LAYS ITS OWN ROAD

Giant power and rugged strength, plus stalwart ability to carry heavy loads and stand up under the stresses of difficult hauling, make the LINN the ideal unit for gruelling construction jobs.

The LINN has tremendous power for steep grades and travel over treacherous ground . . . power that is delivered to patented flexible traction which grips every kind of surface, wet or dry, hard or soft.

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An investigation will convince you of the profitableness of LINN operation. Performance data on LINN tractors in a wide variety of industries is yours for the asking.

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EQUIPMENT YOU OUGHT TO KNOW ABOUT

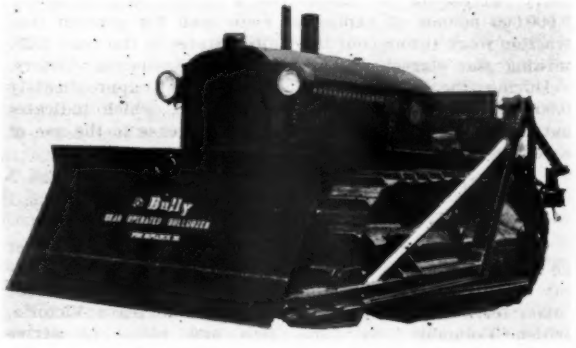
New Redi-Prime Centrifugal Pump

American Steam Pump Company, Battle Creek, Michigan, manufacturers of American-Marsh pumps, have announced the manufacture of an automatic priming, gasoline-driven, portable, centrifugal pump. The complete outfit weighs but 115 pounds, and can be easily lifted and carried by one man as shown in the illustration. The manufacturers say of this new pumping unit, "The Redi-Prime will handle anything that passes the strainer — clean water, hot or cold, muddy and gritty water, oil, or gasoline — in fact all liquids. The special open-type bronze impeller will pass solids up to ½-inch in diameter without the slightest difficulty. Water can be lifted 22 feet by suction, and pumped against heads up to 35 feet. It can be used for pumping from excavations, conduit tunnels, manholes, etc., pumping on scows and barges, supplying water for road building and general construction, and for furnishing water for irrigation, etc. It can be operated from practically any location, even suspended by a rope or chain, or on the running board of an automobile. No foundations, skids or blocking are required. The three-point suspension eliminates vibration and all tendency of the outfit to crawl. For additional information write for Bulletin No. 62, mentioning *The Excavating Engineer.*

Gear-Operated Bulldozer

A new gear-operated bulldozer has been designed by *Niess & Company, Inc., of Minneapolis,* for use with Allis-Chalmers Monarch "50" and "35" tractors.

"The Bully," shown below, is made in two types — the bulldozer with rigid blade, and the backfiller with adjustable blade. The adjustable blade is set unusually near the front of the tractor and is supported and propelled at both ends, a feature which greatly reduces side draft.



The power transmission unit, composed of pinion and bevel gear, together with spur pinion and gear segment, is employed in connection with a Twin Disc clutch and brake. Gears are enclosed in an oil-tight housing attached to the transmission case of the tractor, while the clutch and brake are mounted on the outside of the gear case to be readily accessible.

Advantages of the gear-operated bulldozer include fast and positive action of the blade, a wide travel radius of the blade and additional clearance when high obstructions are encountered. The blade is controlled by a single lever and can be locked in the ground or allowed to float.

Anti-friction bearings are used in the transmission unit, and all moving parts are set on lubricated bearings. Electric welding is employed throughout.

Attaching "The Bully" to a Monarch tractor does not interfere with the use of other equipment on the drawbar. When writing the manufacturer for further information, please mention this magazine.

Improved Blasting Machine

An improvement on the Hercules Ten Cap blasting machine, which makes the machine more moisture and dust proof, is announced by officials of the Explosives Department, Hercules Powder Company, Wilmington, Delaware. A special rubber gasket which seals case and cover has been developed as regular equipment and can be fitted to machines now in use. The Hercules Ten Cap blasting machine is of the dynamo type, is pocket size, and represents the latest development in electrical machine design.

Road Building Increase Accelerates Business Improvement

(Continued from page 289.)

period total $114,101,383 — a sum which will be increased many times over before the year is over.

Pennsylvania, with the largest 1930 state program in the nation, leads in the amount of awards for the first three months with $15,469,853 in signed contracts. That's a lot of money, but it's less than a tenth of the total that Pennsylvania plans to spend for highways this year.

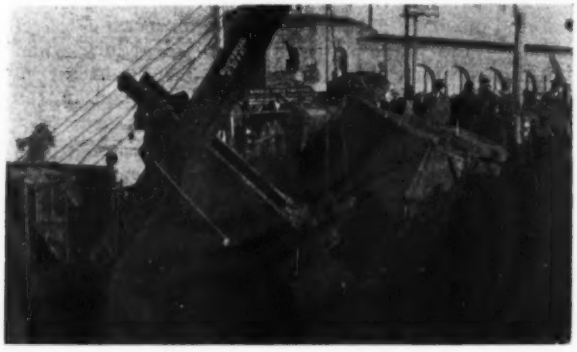
"Improved highways represent a material contribution to the stabilization of business conditions of the present and the future," said Secretary Lamont in his report. "In addition to facilitating the distribution of the innumerable products of the farms and factories when completed, highway construction operations under way involve the use of millions of tons of material drawn from widely separated sources, and they provide employment both directly and indirectly over broader areas than any other type of public works."

SHOTS FROM THE FIRING LINE

Operator Dumond Saves Truck from Bad Spill

Operator G. I. Dumond of the Stewart and Nuss Contracting Company, Fresno, California, handles his Bucyrus-Erie Type 1030 like a big league infielder. He scoops up everything coming his way—even big trucks loaded with dirt. The accompanying picture shows the predicament that Lew Miller, the Stewart and Nuss truck driver, was headed for when Dumond swung to the rescue.

The 1030 was digging the basement for the new Montgomery-Ward building on Fulton Street in Fresno. Miller drove his truck onto the sidewalk at the basement's edge where Dumond was loading directly from the floor 10½ feet



below the sidewalk level. He had just finished loading Miller's truck and Miller started to pull out and into the street.

Suddenly the bank and sidewalk began caving in, taking the truck with Miller in the cab over the side. Operator Dumond at that moment was moving ahead for a new cut. Seeing Miller's danger Dumond swung the dipper over and up, grabbed the left rear end, halted the truck abruptly in its downward journey, and eased it to the floor where Miller scrambled out of the cab uninjured. The whole thing occurred in a few seconds. It was a close call but Operator Dumond's quick thinking coupled with the machine's instant response to the controls not only kept Miller from receiving serious and possibly fatal injuries but saved the truck and shovel from a smash-up.

350,000 Yards New York Subway Rock Excavated in Six Months

Di Marco & Reimann, New York contractors, have made a record on their subway job in the Bronx that will be hard to beat. This job of approximately a half million yards of excavation included 350,000 yards of hard ledge rock. Practically all of this rock excavating has been moved in less than six months. Two Northwest back hoes were used to strip the rock for drilling. This type of machine was ideal for this work as rock was very uneven and could not have been stripped to good advantage with shovels. All drilling was done with Ingersoll-Rand equipment, as high as 75 jackhammers being in use. The main air plant, consisting of three 2500-foot cross-compound, direct-connected Ingersoll-Rand compressors, was located about midway of the job. Three complete drill sharpening units were kept running double shift to keep the drills in shape.

Four Bucyrus-Erie 41-B's were put to work loading out the rock to Mack trucks, which hauled to the dump, a distance of about two miles. These shovels were operated in two eight-hour shifts for over five months, and says Mr. Reimann, "If we could not buy more 41-B's no amount of money could buy these machines. They have performed without lost time for breakdowns all through the job."

One Bucyrus-Erie B-2 with short boom and stick was used for cleaning up sides of the cut. Also a Bucyrus-Erie AA air-operated tunnel shovel (shown in the illustration) was used for close work under timbering and bracing. The contract also included two 18-foot tunnels driven through solid rock for a distance of about 1000 feet. The rock was drilled and shot and then loaded by the AA air mucker to trucks. By

this method 12 to 14 feet of tunnel is driven every day. Water in tunnel is taken care of by a four-inch Cameron pump driven with compressed air.

At this writing the excavation is cleaned up except for about 150,000 yards of earth excavation which will be used for back fill as soon as steel is set.

45,000,000 Pounds of Construction Explosives Used in United States in 1929 and More Expected for Year 1930

Upon a basis of the best estimates available in the industry, according to Explosives Progress, approximately 45,000,000 pounds of explosives were used for general construction work throughout the United States in the year 1929, marking the biggest year in America's industrial history.

During the first quarter of this year approximately 10,000,000 pounds of dynamite were used, which indicates that there will be a fourteen per cent increase in the use of explosives in 1930 over last year.

Auto Caravan to Test Section of Proposed International Highway Into Alaska

The proposed automobile caravan which will follow over the first section of the projected extension of the Pacific Highway north from Vancouver across British Columbia and the Yukon territory into Alaska, is expected to leave Victoria, British Columbia, on June 14th and plans to arrive at Hazelton, June 21st. This section of 832 miles is over the Cariboo Road to Quesnel and Prince George. A preliminary scout trip is being made at the present time to designate stopping places and make necessary arrangements for the caravan.

SHOTS FROM THE FIRING LINE — Continued

Plenty of Work Ahead for the Roadbuilders

Last year, according to the American Road Builders Association, 5,651,000 motor vehicles were produced in the United States and Canada, with a valuation of some $3,483,900,000. These, with those already in use, brought a total registration figure for the year of 26,400,000 motor vehicles, an 8 per cent gain in registration over 1928.

Twenty-six million motor cars and trucks that have to have somewhere to go! Of the total 3,016,281 miles of highways in the United States, 660,000 miles are surfaced. The rest range from mountain trails to fairly serviceable secondary roads. Which means that on a Sunday afternoon when every car owner or loaner is out for the weekly outing there is a theoretical average of almost nine cars to every mile of highway, provided they were evenly distributed over all of our roads.

However, anyone who reads the daily toll of auto accidents, or has crawled home into one of our larger cities behind mile after mile of solid packed cars, knows that the twenty-six million autos concentrate on small portions of the 660,000 miles of surfaced highway.

And that we need better roads and more roads as fast as they can be built.

Canada

Nova Scotia Notes

The Minister of Highways of Nova Scotia recently stated that $90,000,000 would be required for improvements to the highways of Nova Scotia during the next twenty years, and that at least 1,000 miles of roadway in the Province would have to be paved. The Province at present has 14,976 miles of roads. Of these highways about 1,600 miles are classed as trunk roads, of which approximately 1,375 have been graded and surfaced.

Saskatchewan Notes

Nearly $7,000,000 will be spent on Saskatchewan roads this season according to an announcement by the Minister of Highways, during the course of the debate on the budget in the legislature. The total of $6,852,386 is to be divided as follows: On trunk highways, $2,963,585; gravel surfacing, $3,373,801; sundry grading, $395,000; colonization roads, $120,000. The latter refers to roads in newer districts of the Province, part of the scheme of the new Anderson government. As for the highways, the present policy calls for three standards of road construction rather than two as formerly, namely, main market roads, standard construction roads and colonization roads. The Minister outlined in detail the work planned for 1930 in each section of the Province. Included in this program is the completion of No. 6 highway south of Regina. Attention would also be given to the two east and west trans-provincial highways, namely, the Soo line and Nos. 9 and 4. The road south from No. 1 in the southwest part of the Province, to join with the Montana road, would be constructed this summer after study of the ground and consultation with Montana authorities.

Manitoba Notes

According to latest reports the **good roads program for Manitoba** this year calls for an estimated capital expenditure of $4,000,000. The estimate is made up of $2,000,000 in unexpended balance and receipts, and $2,000,000 in the new capital vote. In addition, there is a special capital estimate of $250,000 for the purpose of extending the Trans-Canada Highway to the Ontario boundary to meet the highway from Kenora. New grading for 1930 will total 132 miles, and new surfacing and resurfacing total 688 miles. The above is the largest road maintenance program in the history of Manitoba, exceeding last year's figures by 200 miles.

Honorable W. R. Clubb, Minister of Public Works, Winnipeg, Manitoba, has announced early construction of the Manitoba portion of the trans-Canada Highway that will connect Winnipeg with the Ontario border. It is estimated that the following expenditures will be made on this work: Clearing, $19,000; common excavation, $104,500; borrow, $79,500; solid rock, $76,000; surfacing, $146,000; and miscellaneous, $90,000.

New England Notes

BY E. D. COOGAN

O'Neil Brothers of Hartford are subcontracting the excavation for the new Veteran's Hospital at Newington. Murch Brothers of St. Louis are the general contractors.

The Bucyrus-Erie type 1035 (top) was just starting a cut for a tunnel and encountered some clay shale, but apparently the digging came easy for this sturdy 1-yard rig. The lower view shows their Bucyrus-Erie Gas + Air, which incidentally is the first Gas + Air shipped to the New England states. Although she has seen four years of use she is still giving excellent service.

BY J. C. ALEXANDER

The accompanying illustration shows a Bucyrus-Erie type 1035 owned by the **Crystal Sand and Gravel Company** of South Braintree, Massachusetts, excavating for a small reservoir. This is to be used to supply water for washing the screened sand and gravel from their pit. The 1035 is equipped with a 40-foot boom and a 1-cubic-yard Peerless bucket.

Eastern Notes

BY STUART M. CHRISTHILF

McNichol Contracting and Paving Company of Philadelphia awarded contract for grading and shaping Broening Park, listed as Contract 551, 225,000 cubic yards of grading at $64,125.

Sanford & Brooks of Baltimore were low bidders on bridge over Curtis Creek on Pennington Avenue at $676,987.

W. C. Briddell Company, Inc., 100 North Eutaw Street, Baltimore, was low bidder at $230,325 for two settling tanks at Back River sewage disposal plant.

No Rush

Voice over the telephone: "This is Mr. Henpeck, doctor. My wife has dislocated her jaw. If you're out this way some time next week or the next, you might stop by and see her."

WORLD NEWS STORIES OF THE KOHLER ELECTRIC PLANT—No. 16

Summit House, Pike's Peak, Colorado

on top of the world

THE shelter house of Pike's Peak Summit is over 14,000 feet above the sea . . . surrounded by a mountain wilderness . . . miles from electric power lines. Yet night after night its searchlight plays over the surrounding Rockies, peering into the darkness, visible even on the distant plains.

On top of the world! Yet caretakers and tourists who come to Pike's Peak enjoy the comfort and convenience of the latest things electrical. The same Kohler Electric Plant which lights up the mountain beacon provides reliable electric current for the use of visitors and habitants. Running silently smooth, its motor serves as the power house providing the summit with modern electricity.

Kohler Electric Plants supply dependable electric current — direct or alternating — for scores of dredging, excavating, building and engineering jobs. They're compact, rugged and reliable. In industrial plants, lumber camps, on trains or trucks, at oil wells — wherever constant or emergency electric current is needed. No other unit is so efficient.

Kohler plants are sturdy and compact — readily portable over rough country. No large storage batteries are required. Fueled by gasoline, natural or artificial gas. Capacities from 800 watts to 10 K.W.

Operation of a Kohler Electric Plant is as simple as running an automobile. The motor starts automatically and runs only when light or power is turned on.

Send coupon for complete information TODAY. . . . Kohler Company. *Founded* 1873. Kohler, Wis.—*Shipping Point*, Sheboygan, Wis.—*Branches in principal cities*. . . . Manufacturers of Kohler Plumbing Fixtures.

KOHLER OF KOHLER
ELECTRIC PLANTS

KOHLER CO., Kohler, Wisconsin EE-6-30

Gentlemen:

Please send catalog describing Kohler Electric Plants.

*Name*_____ *Street*_____

*City*_____ *State*_____

*Use in which interested*_____

SHOTS FROM THE FIRING LINE — Continued

Board of Directors of **Chesapeake and Potomac Telephone** Company of Baltimore authorized expenditure of $588,852 for additions and improvements to telephone plant in state.

Operator Robert M. Rogers is operating the one-yard Byers Master Steamer for the National Excavating and Contracting Company, Inc., of Washington, D. C.

Vincent Schiavi of Buffalo is progressing rapidly with his Mount Vernon Boulevard job in Washington, D. C., on which he is using two Lima "101" shovels and a Northwest dragline.

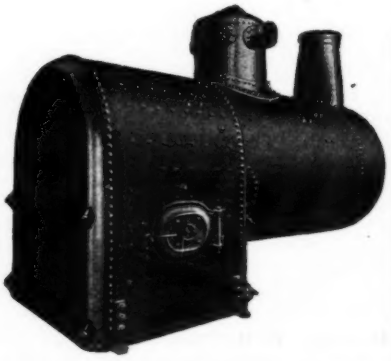
New York Notes

Here we see **Sam Cittandino's** Bucyrus-Erie steamer stretching to keep her sinews limbered up while waiting for another Mack to wheel up to the basement excavation for the Mohegan Store Extension at Utica. This veteran of many basements is still full of pep and good for many more.

Super Strength Plus—

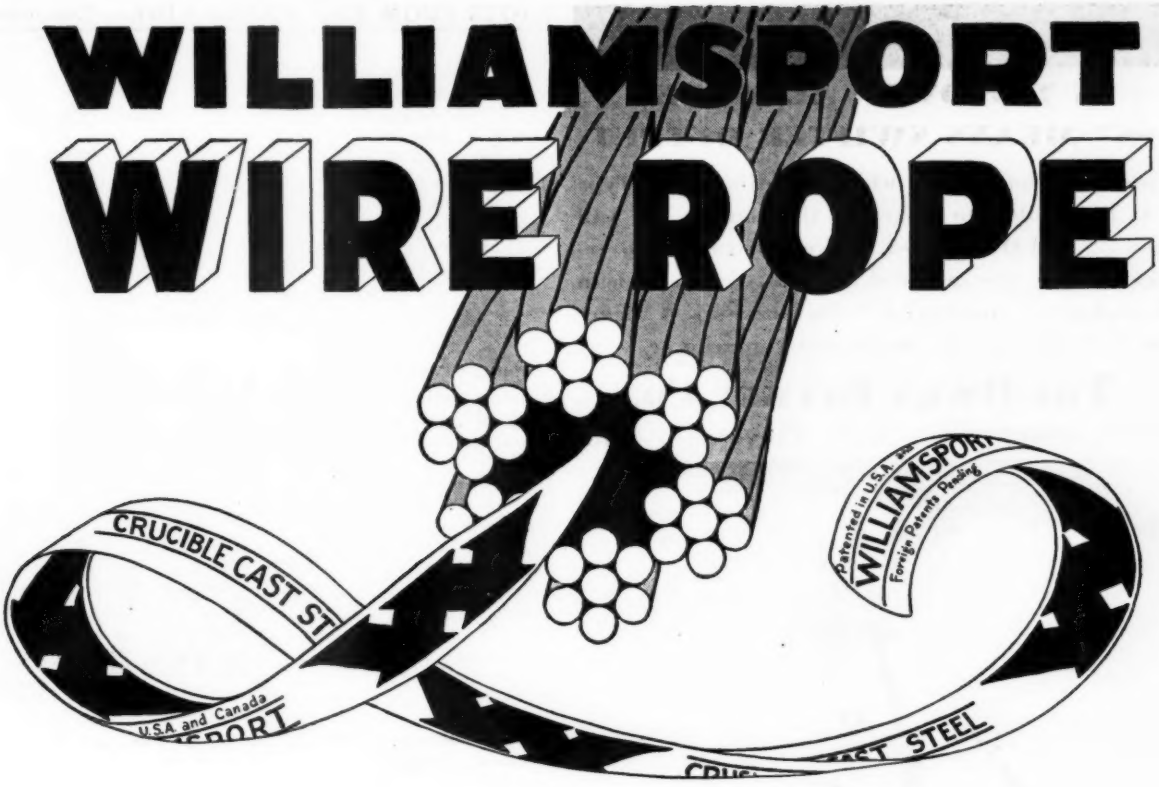
65 Years of boiler building has demonstrated the wisdom of constructing them not only strong and sturdy, but also efficient, easy to clean and capable of continued operation with the minimum of expense. Thousands of users throughout the world are boosters of JOHNSTON quality boilers.

JOHNSTON Boilers are built to meet all requirements, and are fully guaranteed. If you have a boiler problem let us help you.



JOHNSTON BROTHERS, Inc.
Ferrysburg, Mich.

WILLIAMSPORT WIRE ROPE



Regardless of its construction or its use you need proper and positive information on the quality and grade of Wire Rope you put into service, and Williamsport alone supplies this definite information in an unmistakable manner through its Telfax System of identification.

There is so much similarity in the appearance of each grade that this service is given to the user as a protection against substitution and mistakes.

Getting the wrong grade of Wire Rope into service, often with resultant accident or disaster, may happen any time with ropes of uncertain strength. Guard against this by using Williamsport, each grade of which is definitely proven by the Telfax Marker.

Write us for further interesting facts about Williamsport Wire Rope and get our prices.

WILLIAMSPORT WIRE ROPE COMPANY

Main Office and Works: **Williamsport, Pa.** ***General Sales Offices:*** **Peoples Gas Bldg., Chicago**

In writing to Williamsport Wire Rope Co. please use post card bound in the center of this number.

IN THE OWEN ALPHABET
"S" MEANS SWIFTER OUTPUT

Count on these large, wide-spreading Owen Type "S" Rehandlers to make fast time on the job. And how! A full Owen-sized load every time . . . overloads where the material is deep . . . quick, clean dumping . . . nothing left for clean-up. A Bigger Day's Work—yes sir, that's under guarantee.

THE OWEN BUCKET CO.
6026 Breakwater Ave., Cleveland, Ohio

OWEN CLAMSHELL BUCKETS
Owen Buckets

SHOTS FROM THE FIRING LINE — Continued

The accompanying illustration shows a Bucyrus-Erie 20-B owned by the **Arthur A. Johnson Corporation** being used on their Queens Subway Contract at Forrest Hills, Long Island, New York, as a pile driver with all steel leads and a size 2 Union Hammer. This machine is driving 18-inch steel beams 40 feet long and weighing 100 lbs. per foot.

Pennsylvania Notes

King Brothers of Dillsburg, Pennsylvania, have just completed a job of road work between Bartonsville and Apenzell, Monroe County, Pennsylvania, on which they have been pelting away all winter on account of very hard rock. They are moving their Bucyrus-Erie Type B-2 steam shovel and Mack trucks to Kresgeville, Monroe County, on more road work. Good luck to the Brothers.

A consolidation of two of the largest lime and limestone producing companies east of the Mississippi River has just been effected by Arthur W. Thompson, for many years president of the Philadelphia Company here, and later head of the U. G. I. Corporation of Philadelphia. The companies involved are the Chemical Lime Company and the Center County Lime Company both located near Bellefonte, Center County, Pennsylvania. The new company will be known as the Chemical Lime Company, Inc., and its president will be John L. Burns, whose association with Mr. Thompson dates back to Baltimore & Ohio railroad days. The new company will have a capitalization of $1,500,000, and the financing was arranged by the Alexander Brown Company of Baltimore. The two companies in the past have specialized in the production of agricultural lime and lime used in the manufacture of paper, glass and steel. In addition, the two companies had a combined output of about 250,000 tons of commercial stone used in the construction of macadam and concrete highways. The firm of Reinhold & Company, Incorporated, 1422 Oliver Building, Pittsburgh, will continue as exclusive selling agents for the highway materials produced by the new company. Since resigning as head of the U. G. I. Corporation, Mr. Thompson has become interested in several important manufacturing

NOVO
FLUD-LITE LIGHTING UNITS

For lighting cranes—shovels—construction jobs—cheaply and dependably—compact—light in weight—with standard generator and Novo Roll-r Engine. 1¼ to 25 K. W.

Please send me the special folder

Name _____

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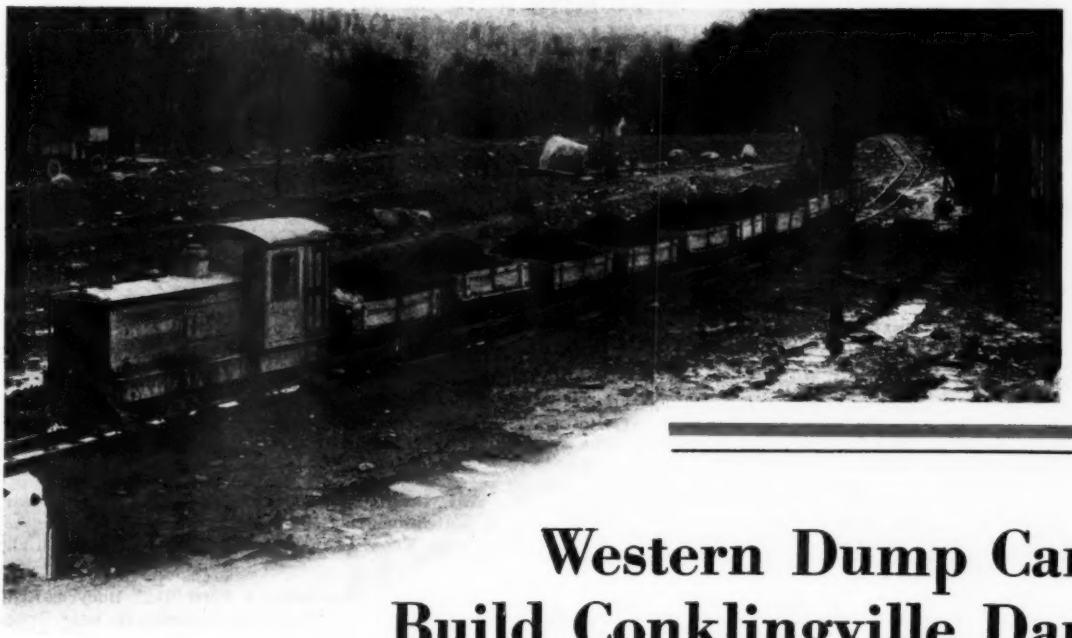
Mail to **NOVO ENGINE COMPANY**
222 Porter St., Lansing, Mich.
Clarence E. Bement, *Vice-Pres. & Gen. Mgr.*



Western Dump Cars Build Conklingville Dam

THE material used in the construction of the Conklingville Dam was handled in Western 4-yard dump cars. An average of 135,000 cubic yards per month was placed in embankment, the cars hauling the material for the core and rip-rap for the upstream slope. Earth or rock was handled with equal facility by the cars.

This is the type of work Western narrow gauge cars are performing in all parts of the world. Great strength, ease and speed of operation, low upkeep cost, unusual track-riding ability and adaptability to a wide range of conditions are characteristics of Western dump cars and are the foundation of their popularity.

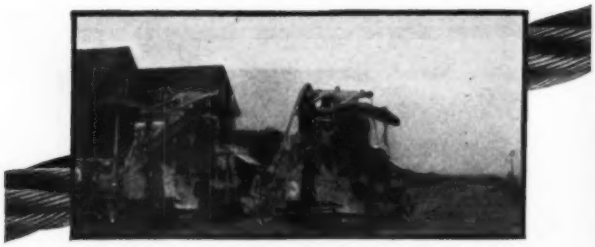
Western dump cars are built in all sizes, both standard and narrow gauge. Your request for our car catalog 71-K involves no obligation on your part. Write today.

A Western car of the type used in building the Conklingville Dam. Western 4 and 5-yard dump cars are built for heavy duty and can be depended upon for years of useful service.

WESTERN WHEELED SCRAPER COMPANY

AURORA, ILLINOIS, U. S. A.

WESTERN



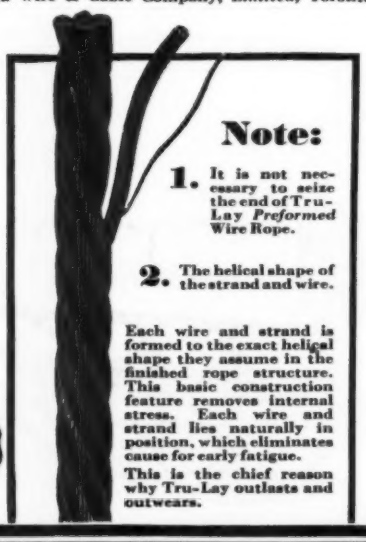
On two mixers—side by side
Tru-Lay *outlasts*
four ordinary wire ropes

Here is a perfect test of wire rope endurance—Tru-Lay *Preformed* Wire Rope on the right hand Rex Concrete Paver shown above, and ordinary wire rope on the other Rex Concrete Paver.

Ordinary wire rope lasted only three weeks. The *fourth* ordinary wire rope was removed on the *same day* that the *first* Tru-Lay Wire Rope was replaced.

While a 300% increase in service cannot be generally expected of Tru-Lay, this performance is by no means exceptional. There are so many instances of increased service from Tru-Lay, varying from 30% to 300%, that it will pay you to investigate Tru-Lay *Preformed* Wire Rope.

AMERICAN CABLE COMPANY, *Incorporated*
New York Central Building, 230 Park Ave., NEW YORK, N. Y.
District Offices: Chicago, Detroit, Philadelphia, Pittsburgh, Tulsa, San Francisco
An Associate Company of the American Chain Company, *Incorporated*
Canadian Licensed Manufacturers:
Dominion Wire Rope Company, *Limited*, Montreal
Canada Wire & Cable Company, *Limited*, Toronto



Note:

1. It is not necessary to seize the end of Tru-Lay *Preformed* Wire Rope.
2. The helical shape of the strand and wire.

Each wire and strand is formed to the exact helical shape they assume in the finished rope structure. This basic construction feature removes internal stress. Each wire and strand lies naturally in position, which eliminates cause for early fatigue.

This is the chief reason why Tru-Lay outlasts and outwears.

PREFORMED WIRE ROPE
TRADE TRU-LAY MARK
[REG. U.S. PAT. OFF.]
Costs less because it lasts longer

SHOTS FROM THE FIRING LINE — Continued

institutions, among which are the McKinney Hardware Company, and the Hookless Fastener Company of Meadville, Pa.

The accompanying illustration shows the unusual formation of tilted strata encountered in one of the Chemical Lime Company quarries.

Pittsburgh and Vicinity

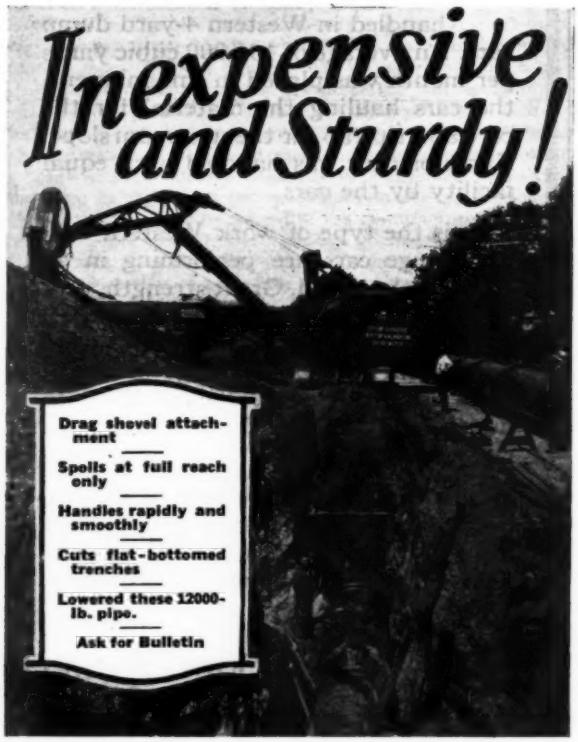
BY J. S. WEAVER

A. L. Dimitt is operating a Bucyrus-Erie Gas + Air shovel for State Construction Company on state highway construction near Knox, Pennsylvania. J. E. Murray is in charge of this work.

M. V. Cline is operating a Type "B-2" Bucyrus-Erie shovel for the Blue Ridge Construction Company, near Brownsville, Pennsylvania, on state highway work.

Nelson Neiley is operating a Bucyrus-Erie Type "B-2" shovel for United Construction Company on state highway work.

Inexpensive and Sturdy!



Drag shovel attachment
Spoils at full reach only
Handles rapidly and smoothly
Cuts flat-bottomed trenches
Lowered these 12000-lb. pipe.
Ask for Bulletin

PAGE ENGINEERING CO. 844 RUSH ST. CHICAGO — ILL.
DRAG SHOVELS—DRAG LINES—BUCKETS—SLACK LINES—DIESEL ENGINES

Bucyrus-Erie D-2 Dragline . . powered with an Atlas Imperial Diesel . . in use at Cedar Rapids, Iowa

NEVER BEFORE

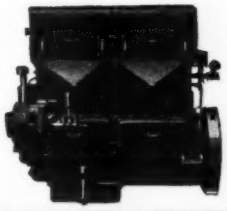
such economies in dirt-moving

Burning cheap, low-grade fuel oil, that costs only ⅓ to ¼ as much as gasoline . . and consuming only ½ to ⅓ as much . . you can get fuel costs at 75% to 90% those of a gas machine. . .

A saving of 42½% a day over steam . . is an engineer's report on an Atlas Imperial-powered excavator in logging work. . . Another operator reports total fuel costs of $43 . . for a 25-day dirt-moving job of 20-hour shifts. . .

Besides! . . you should see the yardage that these excavators turn in. . . They're hogs for dirt. . . The tougher the going, the harder they pull. . .

Under heavy load, and consequent lower speed . . where a gas engine normally stalls . . the Atlas Imperial lugs. Its lugging power (torque) is increased . . because, with its common rail fuel system, proper atomization is maintained in the Atlas Imperial over the entire range of speeds. . .



USED IN Bucyrus-Erie Excavators : P & H (Harnishfeger) Excavators : Link-Belt Excavators : Thew Excavators : Plymouth Locomotives : Lidgerwood Logging Equipment.

Day-in and day-out . . continuously . . from shift to shift . . the Atlas Imperial stands the gaff . . marine diesels built in 1916 are still in daily service . . with no signs of giving in. . .

In 10 seconds . . it starts from stone cold to full load . . ignition is by the heat of compression . . no spark plugs . . no troublesome ignition system. . .

Six years of actual operating experience have now demonstrated that the excavator powered with an Atlas Imperial Diesel is by far the cheapest . . and fastest . . dirt-moving method ever conceived. . .

Before you buy another excavator . . be sure to investigate the Atlas Imperial. For more information . . mail the coupon.

ATLAS IMPERIAL
FULL DIESELS

A full line—from 20 HP to 500 HP

BRANCH OFFICES: *New York · Chicago · New Orleans · Portland, Oregon · Houston, Texas · San Diego, Los Angeles, Terminal Island, California.*
DISTRIBUTORS: *Ferrier & Lucas, Vancouver, B. C. · Atlas Engine Co., Seattle · Fleck & Stelfox, Baltimore · L. R. Beatty, Philadelphia · T. Ralph Foley, Gloucester, Mass. · J. L. Latture Equipment Co., Portland, Ore. · Et. Davio, Papeete, Tahiti · A. B. Donald, Ltd., Auckland, N. Z. · W. Holmes, Sydney, N. S. W. · Honolulu Iron Works Co., Honolulu, T. H. · Lidgerwood Pacific Co., Tacoma, Wash.*

Atlas Imperial Diesel Engine Co., 2867 Glascock St., Oakland, California: Mail information on Atlas Imperial Full Diesels.

*Use*_____ *Name*_____ *Company*_____ *Address*_____

In writing to Atlas Imperial Diesel Engine Co. please use coupon or post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

ROBERT PETRIELLO

An unfortunate accident on April 29th took the life of Robert Petriello, 67, partner in the firm of Petriello and Petriello, of South Brownsville, Pennsylvania. Mr. Petriello stepped into the path of one of his trucks as it was backing into a concrete mixer at his job at Vestaburg on the Brownsville-Waynesburg Highway. Death resulted from a fractured skull and broken neck. He leaves a widow, Mrs. Ella Petriello; an adopted daughter Marie; a brother Sylvester, with whom he was associated in business and another brother in Italy.

Mr. Petriello has been in the contracting business at Brownsville for over 40 years. Included among the larger contracts handled by the brothers are such projects as the $100,000 sewerage contract in Philadelphia; another similar contract at Morristown, New York, and more than a dozen miles of track for the Monongahela Railway Company at Brownsville.

HARRY CRONIN

The recent death of Harry Cronin (42), for many years head of the Pittsburgh Contracting Company bearing his name, came unexpectedly after a month of illness with bronchitis which was not believed to be serious. Mr. Cronin was born in Pittsburgh and took over from his father the Thomas Cronin Company, well-known and highly regarded construction firm. Mr. Cronin is survived by his widow, Mrs. Nell Cronin, his son Thomas, and his mother, Mrs. Julia Cronin, of Mount Washington.

W. S. Hench and C. C. Vaughn are operating Bucyrus-Erie Gas + Air shovels for J. F. Sours, at Carlisle, Pennsylvania.

The accompanying illustration shows **A. D'Alessandro's Bucyrus-Erie Type 1030 drag shovel** working at Munhall, Pennsylvania, on his eight-mile sewer job. Operator Albert D'Paul has stepped off the machine to look over the grades.

Early completion of the Saw Mill Run boulevard extension, on which work has been started, was promised today by the contractors, **S. J. Groves & Sons.** The contract stipulates that the road be completed within 170 working days. The boulevard, extending two miles from the Brownsville road in Brentwood through Overbrook to Maytide Street, will bring Brentwood within nine minutes of the Golden Triangle. The maximum grade — for less than a fifth of its length — will be 7 per cent. The roadway will be 30 feet wide in Brentwood and 40 feet in Overbrook. The Boulevard will be the main road to the county airport, and also part of the principal state highway route between Pittsburgh and Uniontown.

Striking a high prosperity note, the Allegheny County Commissioners awarded contracts totaling more than

FEWER REPAIRS

It isn't so much what breakdowns cost in themselves—it's the delay to production that really hurts. You're not getting any hole down while the drill boss is using a monkey wrench for adjustments or repairs.

That's why we've built

CLIPPER DRILLS

with an extra margin of rugged strength all through. And because they are able to keep everlastingly at it — steadily, uufalteringly—Clippers add extra feet drilled to the larger production given by their unequalled speed.

Either round wheel or crawler type, welded steel or wood frame furnished. All steel machine if specified.

Write for full information.

THE LOOMIS MACHINE COMPANY
(Established 1842)
K Street, TIFFIN, OHIO

GREDAG
REG. U. S. PAT. OFF.
LUBRICANTS

FOR

AUTOMOTIVE EQUIPMENT

The same grades that have made Gredag so popular with operators of shovels, crushers, conveyors, ditchers, cranes, hoists, mixers and other outdoor machinery, are unmatched for lubricating

AUTOMOBILES, TRUCKS AND TRACTORS

Use Gredag No. 314 for enclosed gears on industrial or automotive machinery. It outlasts ordinary lubricants and prevents excessive wear of the gear teeth. Gredag gives months of extra service.

Send for folder Form 910.

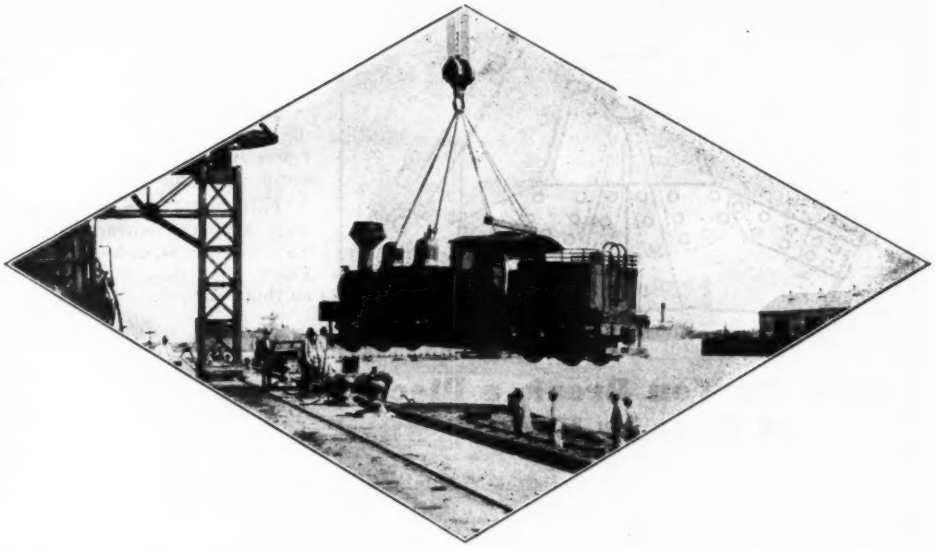
ACHESON GRAPHITE CORPORATION
Unit of Union Carbide UCC *and Carbon Corporation*
NIAGARA FALLS, NEW YORK

"HERCULES"

RED-STRAND

REG. U.S. PAT. OFF.

WIRE ROPE

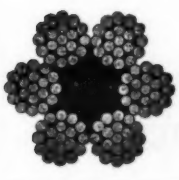


For Hard Work of All Kinds

Wherever wire rope is used for hard work; when or where conditions make strength and wearing qualities necessary; when safety is a vital factor—then and there is where "HERCULES" (Red-Strand) will give a good account of itself.

This wire rope is made of acid open-hearth steel wire, and every wire used is first rigidly tested by us to make sure that it comes up to our exacting specifications. Furthermore, it is made in both Round Strand and Patent Flattened Strand construction in order to meet all working conditions.

If you will tell us how you use wire rope we shall be glad to suggest the construction we consider best for your work.



Made Only by **A. Leschen & Sons Rope Co.** Established 1857

5909 Kennerly Avenue
ST. LOUIS

New York Chicago Denver San Francisco

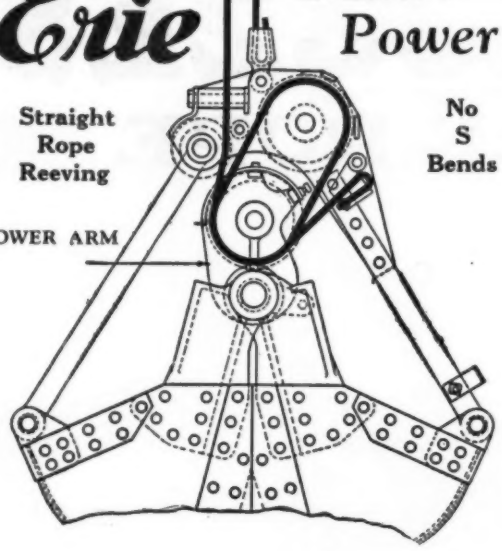
In writing to A. Leschen & Sons Rope Co. please use post card bound in the center of this number.

Erie Multi-Power

Straight Rope Reeving

No S Bends

POWER ARM



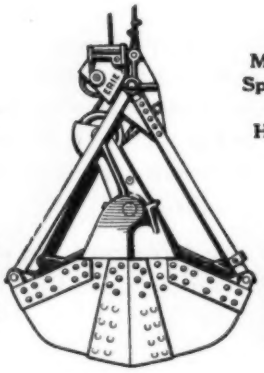
How Do You Break a Piece of Wire by Hand?

By bending it back and forth, of course. In other words reverse or S bending it. This is exactly the condition that exists in some types of Clamshell buckets and it is no wonder that they are hard on cables.

Before buying a Clamshell Bucket be sure that this condition does not exist and thereby keep maintenance at a minimum.

REVERSE OR S BENDS CUT CABLE LIFE 40 to 50%

A Type for Any Need



Peerless Multi-Power Special Digger Scraper Heavy Duty

If you will look closely at the line drawing of the Peerless bucket you will see that they are built to stand hard service.

All Erie Buckets are of the power arm type, because this design has proven to be better diggers and faster in operation.

Write for Catalogs.

ERIE STEEL CONSTRUCTION CO.

ERIE Box 8—South Erie Station PENNA.

AGGREMETER PLANTS — STORAGE BINS

SHOTS FROM THE FIRING LINE — Continued

$2,000,000 for road developments, bridges and County Park improvements. This is the largest batch of contracts issued in many months. The largest and most important contract is for the building of the Allegheny River Boulevard, which was awarded to the John F. Casey Company.

Richard (Dick) Smith is operating a Bucyrus-Erie Type "A" shovel for Booth & Flinn on their West Carson Street contract.

L. Steele Clark Company, Cherry Tree, Pennsylvania, have their Bucyrus-Erie Type "B-2" working on state highway work near Duncansville, Pennsylvania.

William Martin, who has been ill for some time, is once more able to return to work for the R. H. Cunningham Sons Company, on a Bucyrus-Erie Type 41-B.

James & Nicholson, Johnstown, Pennsylvania, are making the dirt fly on their state highway contract near Danville, Pennsylvania. Bucyrus-Erie steam and Gas + Air shovels are used on this work.

Fort Pitt Construction Company, Pittsburgh, have their state highway contract near Brownsville well under way. This contract is under the personal direction of Mr. Walter Faber. Bucyrus-Erie steam and Gas + Air shovels are used on this work.

The Real Worry

Aunt: "Aren't you ever afraid you'll lose control of your car?"

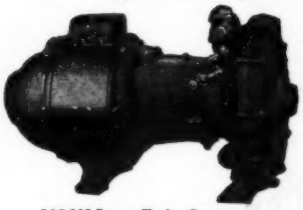
Daredevil Nephew: "Constantly; I'm two installments behind already."

The Last Resort

George: "Do you believe in clubs for women?"

Earl: "Yes, if kindness fails."

The MOON Can Light Your Job *Profitably*



MOON Steam Turbo Generators
Capacities—1 to 4 K W

"WE have found that the MOON requires a minimum of repair which means uninterrupted service. We believe them to be the most satisfactory lighting device for night work. Any future installations will be MOON"—writes the Massman Construction Co. of Kansas City.

And that's the MOON story in a nutshell—low operating and upkeep cost with reliable, consistent performance.

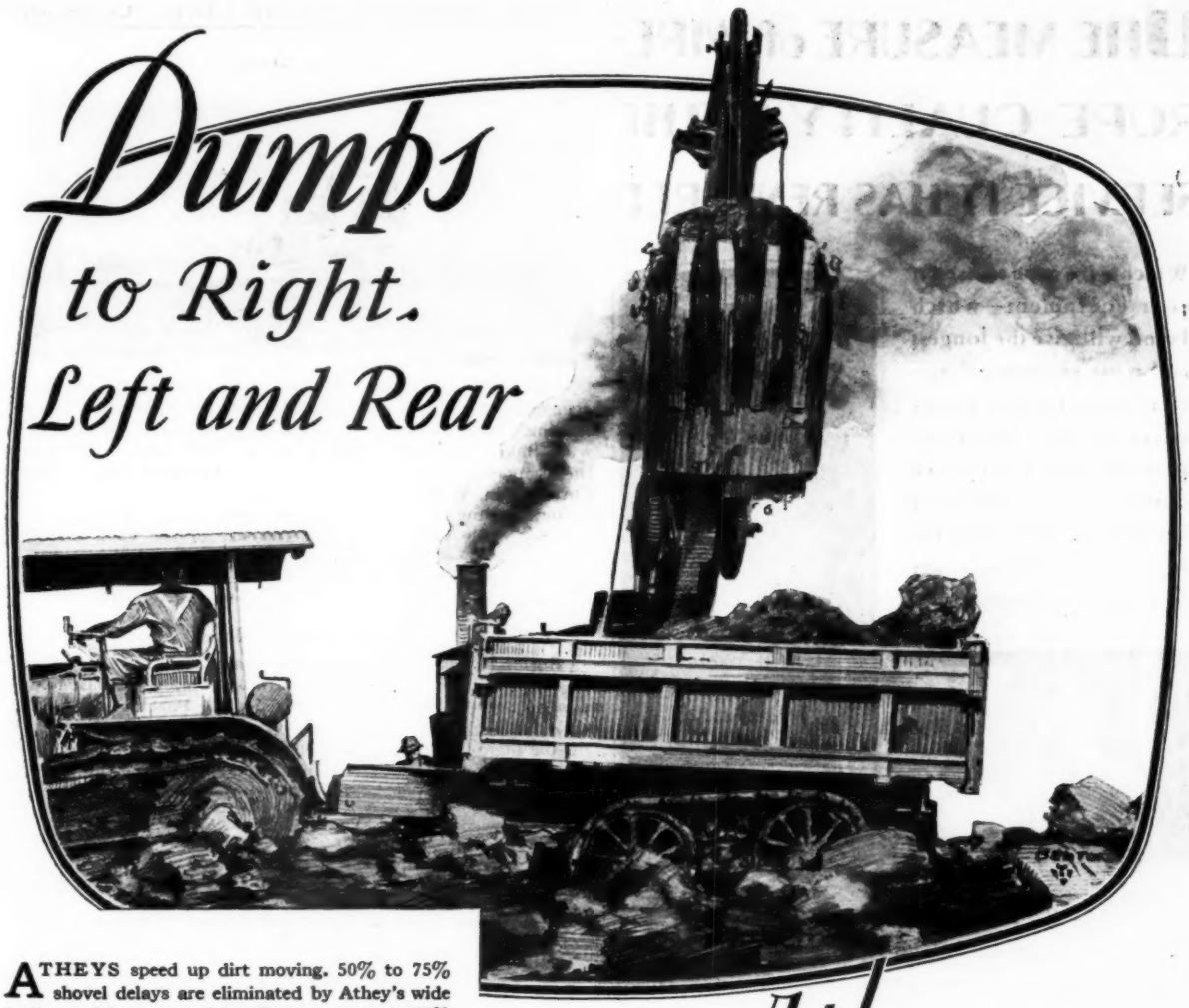
Let us show you how the MOON can serve you *profitably.*

Write for Bulletin No. 16-W.

THE MOON MANUFACTURING COMPANY
114-128 No. Jefferson St., Chicago

MOON LIGHTING OUTFITS

Dumps to Right. Left and Rear



ATHEYS speed up dirt moving. 50% to 75% shovel delays are eliminated by Athey's wide bodies and large capacities. Tractors operate 25% faster with less strain—handle Atheys easier—pull bigger pay loads per trip—make fewer trips per job. Atheys dump to the right, left or rear—fit ALL jobs—dump quickly, cleanly, without time-wasting maneuvering or expensive bull-dozing. Non-miring, they work rain or shine, eliminating costly wet weather operating delays.

Atheys are one-man operated units. They move more dirt with lower costs—more jobs per year—less cost per yard—more profit per job.

Write for complete information.

Athey

3-WAY DUMP TRAILERS

ATHEY TRUSS WHEEL CO.
130 N. Wells St., Chicago, U. S. A.
Cable Address: "Trusswheel, Chicago"
Foreign Representatives:
The Baldwin Locomotive Works, Philadelphia, Pa.

ATHEY TRUSS WHEEL WAGON

IT BRIDGES THE SOFT SPOTS

In writing to Athey Truss Wheel Co. please use post card bound in the center of this number.

THE MEASURE of WIRE-ROPE QUALITY IS THE SERVICE IT HAS RENDERED

Which wire rope to use on your equipment—which brand will give the longest and most economical service—may be best determined by past records of performance established under similar operating conditions. This and the reputation of the maker are of paramount importance.

FOR over half a century American Wire Rope, made exclusively by the American Steel & Wire Company, has demonstrated its superiority—proved beyond question that its tough, flexible and abrasion-resistant nature is the best insurance against breakdowns and costly delays.

Regardless of your particular problem, you will find an American Wire Rope exactly adapted to its economical solution. Consult our nearest branch office or distributor to get the right rope for your purpose.

AMERICAN
STEEL & WIRE COMPANY
WIRE ROPE

AMERICAN STEEL & WIRE COMPANY
SUBSIDIARY UNITED STATES STEEL CORPORATION
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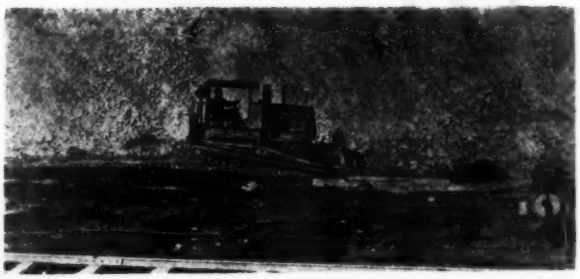
SHOTS FROM THE FIRING LINE — Continued

Illinois Notes



The above illustration shows how a northern Illinois open-cut coal miner cleans up his coal before the shooting and loading. Here we see an Allis-Chalmers Monarch "50" tractor with Baker bulldozer cleaning up the "odds and ends" that the stripper has left in the mine of the **Northern Illinois Coal Corporation, Wilmington.** The former method employed was to put a gang of ten or a dozen men on the thin ends of brooms, while in cold weather the size of the gang greatly increased. The Monarch and bulldozer accomplished 85% of the work formerly done by hand, in a very satisfactory manner — and with a considerable saving of expense.

Mesaba Range Notes

Butler Brothers of Cooley, Minnesota, have been stripping this season at the Ann, Kevin, Harrison, Halobe and Hoadley mines. A new unit being erected at the Partick plant will make this a full two-unit plant with batteries of twelve jigging plants. Two new Koppers rheolaveur rewashing plants are going in at the Patrick and Harrison as a result of the success of the experimental rewasher at the Harrison last season.

Shifting and Raising Track on Construction Jobs

Building the waste dump on this railroad yard construction job involved much shifting and raising of track. As on many similar jobs in construction work, quarries, open pit mines and railroad work, the Track Machine and a few men replaced the large track gang ordinarily required where hand methods are employed.

Write for Bulletin GR-8.

NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED
TRACK MACHINE

Nothing like it
for shallow grading!

AS this typical experience goes to prove. Out in Cincinnati, Clarence Boehning, Contractor, used the Excavator to dig out wet, sticky, yellow clay in grading sub-division streets when 'twas so wet they had to plank for trucking. In better weather they took out up to

700 cu. yds. per 9 hour day

which is *some* yardage considering size, price and operating cost of the machine. Remember! any man on the job who can run a truck can become your operator—at his regular wage. That's an economy that cuts the cost of every yard you dig. *Ask for Bulletin 629 for details.*

GEORGE HAISS MANUFACTURING CO., INC.
144th St. and Park Ave., New York
Representatives in Principal Cities

664

SHOTS FROM THE FIRING LINE — Continued

St. Louis and Vicinity

BY A. J. KOENIG

Contracts have been awarded for Sections 4, 6 and 7 for a joint double-track line between Birmingham and Polo, Missouri, by the Chicago, Rock Island & Pacific Railway Co. and the Chicago, Milwaukee, St. Paul & Pacific Railroad Co. Section 4, seven miles long, was awarded to the **Winston Bros. Co. of Minneapolis,** and Sections 6 and 7, comprising thirteen miles, were awarded to **Peterson, Shirley and Gunther of Omaha.**

The United States Engineers Office at Vicksburg, Mississippi, received bids for the construction of 4,385,000 cubic yards of levee work on the Arkansas River in Arkansas, and 10,400,000 cubic yards of levee construction on the Mississippi River in Mississippi, Arkansas and Louisiana.

Bids for the construction of 156 miles of paving and 19½ miles of grading have been received by the **Illinois State Highway Commission.** The average cost per mile for paving will be $24,243, including the cost of cement which will be furnished by the State.

Following were the low bidders on the large projects: Route 96, Section 119, 9.93 miles in Hancock County, **S. J. Groves & Sons, Minneapolis,** $246,322; Route 104, Section 106, 8.06 miles of paving in Morgan County, **Cast Stone Construction Co., Bloomington,** $151,822; Route 49, Section 114, 8.63 miles of paving in Clark and Coles Counties, **Jos. Kesl & Sons, Edwardsville,** $150,713; Route 92, Section 136, 4.04 miles paving in Whiteside County, **Cast Stone Construction Co.,** $85,518. **The Congress Construction Co.** of Chicago was low bidder on the substructure of the Hardin bridge over the Illinois River with a price of $284,832.

John Marsch of Chicago has his outfit on the job ready to begin work on his section of the new Rock Island line at Lawson, Missouri.

A. P. Nolan, St. Louis, was granted contract, at a bid of $48,000, for the grading incident to the depressing of the track of the Rock Island Railroad through Forest Park in St. Louis.

The Service Construction Co. of Poplar Bluff, have finished an 18-mile stretch of highway between Fredricktown and Farmington, Missouri, and will soon begin work on Route 32 at Farmington.

The Stewart Sand and Material Company, 304 City Bank Building, Kansas City, recently announced the addition of crushed stone and stone products to its line of building materials through the leasing of substantially all of the properties of the Consumers Material Corporation.

"Hickory" Smith has commenced grading with his new Bucyrus-Erie Type B-2 steam shovel, caterpillar tractors, and cat wagons.

B. B. Huffman, Grand Tower, Illinois, has contract for 13,550 cubic yards levee repair work at Perry County, Mo.

Improvement of the Mississippi River between St. Louis, Missouri, and Grafton, Illinois, calling for a 9-foot channel at a cost of $1,500,000, was approved by the House River & Harbor Committee at Washington.

Col. F. G. Jonah, Chief Engineer St. Louis & San Francisco Railroad, awarded contract for depressing track in Oklahoma City to Reid & Lowe, of Birmingham.

Len Gray has a contract for highway grading near McKittrick, Missouri, consisting of approximately 150,000 yards.

T. P. Newland has his shovel outfit busy on a highway grading job in Maries County, Missouri.

Texas Notes

Contracts for the first section of the Maverick County Water Improvement District No. 1 project at Eagle Pass, Texas, have been awarded to the **Trinity Farms Construction**

never before

Have you seen such a *Digger!*

For ability to dig hard material, the new Williams "Champion" goes beyond any previous bucket.

21 IMPROVEMENTS—including corner bars extending beyond the scoops, giving extra leverage—welded scoops of new easy-filling design—larger diameter sheaves—narrower and more rigid head—

and many other improvements have made it possible to place the new Williams "Champion" on your work with the *definite guarantee to outdig any other bucket built.*

G. H. WILLIAMS COMPANY
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Branch Offices: New York, Pittsburgh, Chicago

Before you buy a bucket, it will pay you to try the new Williams "Champion"—it challenges competition, and invites comparative tests.

157

WILLIAMS
BUCKETS—TRAILERS

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A 57-YEAR POLICY UNCHANGED!

THE TAYLOR CHAIN CO. has always been a believer in the fact that good chain, honestly made and sold, would give *more* satisfaction and afford *greater* economy to the purchaser. Since 1873 TAYLOR has maintained its position as a top-notcher by offering the best and most rugged chain made.

S. G. TAYLOR CHAIN CO.

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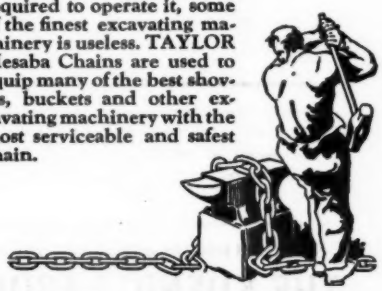
Let us send you "Catalog A"—contains a wealth of chain data that you'll want to refer to. A mighty useful book!

Without the heavy chain required to operate it, some of the finest excavating machinery is useless. TAYLOR Mesaba Chains are used to equip many of the best shovels, buckets and other excavating machinery with the most serviceable and safest chain.



LONGER SERVICE AND FEWER ADJUSTMENTS!

OPERATORS of dredges, draglines, hoists and steam shovels, know that brake, clutch and friction troubles can "throw the monkey wrench" into heavy duty machinery mighty effectively. You can forget most of your operating worries, if you're using the improved GATKE ASBESGRAPHITE MOULDED Brake and Friction Blocks.

More power—smooth, even control and easy operation—with friction troubles and maintenance costs reduced to a minimum—these are outstanding features of GATKE ASBESGRAPHITE Products.

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Hayward Buckets desire positions in the services of concerns seeking digging economy. Address The Hayward Company, 54 Church St., New York, N. Y.
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BUCYRUS ERIE

BUCYRUS-ERIE COMPANY
Specialty Dept.
South Milwaukee, Wis.

VITALLY interested in the successful performance of machines bearing their name, Bucyrus-Erie Company offers a complete line of carefully selected tested accessories and supplies that will give you the best service in keeping your machines operating day after day, month after month, and year after year.

Bulletins on any of the items listed above will be sent on request.

SHOTS FROM THE FIRING LINE — Continued

Company of Dallas and **Bart Moore, Inc., of San Antonio.** The Trinity Farms Construction Company are using Monighan Diesel draglines on their part of the work.

Southern Notes

BY W. W. WHORLEY

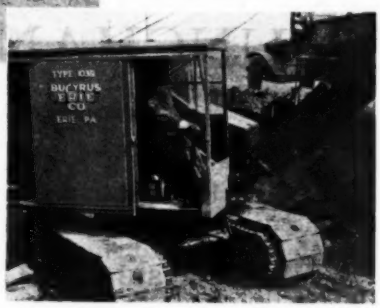
J. W. Bell writes us that he is handling a locomotive crane with clamshell bucket near Monroe, Louisiana.

J. T. Moses is digging iron ore for the Republic Steel Company at Rickey, Alabama.

Wisconsin Notes

BY J. P. MC CLOSKEY

The accompanying pictures show **Contractor Anton Grabske, Cudahy,** and his Bucyrus-Erie Type 1035 gasoline shovel on a basement job at South Milwaukee. In the lower view operator Frank Grabske, Anton's brother, is putting the 1035 through its paces. Contractor Grabske had two Mack trucks and one Titan truck hauling this material to the far side of town, but in spite of this long haul the 1035 was in and out



of the basement in short order. Owner Grabske and operator Grabske are both right well-pleased with the speed of this machine and its ability to get around in the tight places.

San Francisco and Vicinity

BY J. H. SACKETT

CLAUDE M. THOMPSON

Claude M. Thompson, 48, a partner for 20 years in the firm of Thompson Bros., engineering contractors of Fresno, California, died at Oakland, April 12, following a long illness. Thompson was a native of Fresno and a member of local fraternal orders, including the Elks, Rotarians, and York Rite Masons. He is survived by his widow and four children.

Among the largest highway jobs let during May were two jobs in Colusa County. One of these was awarded to **R. G. Le*Tourneau of Stockton** on his bid of $139,326.00. Work involves 240,000 yards of roadway excavation in a total length

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SHOTS FROM THE FIRING LINE — Continued

of 12.7 miles. The other job involving 120,000 yards of roadway excavation in a total length of 8.3 miles was awarded to **Fredrickson and Watson of Oakland**, and **Fredrickson Bros.**, of **Stockton** on their bid of $58,269.00.

BY D. W. EVANS

W. A. Bechtel Company of San Francisco has their Gas + Air Bucyrus-Erie shovel in rock work on some double tracking for the Western Pacific near Oroville, California. The shovel supplies air for drilling, which makes it unnecessary to have a compressor on the job. Jack Regnold is running the machine.

Ariss-Knapp Company of Oakland has one of their Gas + Air Bucyrus-Erie shovels on a railroad job for the Utah Construction Company near Niles, California, on the Western Pacific.

W. H. Hauser of Oakland has moved his Gas + Air Bucyrus-Erie shovel on to a railroad job for the Southern Pacific near Portland, Oregon.

The Morison-Knudsen Company of Boise, Idaho, has one of their Bucyrus-Erie Gas + Air shovels on a railroad job for the Western Pacific near Cromberg, California.

The Utah Construction Company has one of their Gas + Air Bucyrus-Erie shovels on a railroad cut for the Southern Pacific near Madeline, California. This work is on the N. C. & O. Railroad, which is being improved as the last step on the new line following completion of the stretch of the railroad between Alturas and Klamath Falls.

J. P. Holland of San Francisco is practically finished with the excavation of 330,000 yards for Hanrahan Company on an eleven-mile stretch of new highway between Petaluma and Ignacio. Their Bucyrus-Erie Gas + Air shovel has dug a large portion of the yardage on this job, and was recently at work straightening curves where the new road follows the old one. Jim Murdoch, who has been operating the machine, is well satisfied with its performance. Holland is also working on a 45,000-cubic-yard fill job for the Southern Pacific Company at Coyote, California.

Longview Dredging & Construction Co., Rio Vista, California, who bid $.089 per cubic yard, were low bidders to the United States Engineers Office, Sacramento, for dredging in New York Slough and Suisun Bay, which is the first unit of the Stockton Deep Water Channel. This work involves 1,772,000 cubic yards of dredging, etc.

W. A. Bechtel Company, San Francisco, California, has been awarded contract, by the Southern Pacific Company, for the construction of a complete rock-fill dam to be 73 feet high and 400 feet long, on the Bonita River, New Mexico, near El Capitan.

The Pacific Gas & Electric Co., San Francisco, has applied for a preliminary permit for a project on Bear River, Cold Creek, and North Fork of Mokelumne River, in Amador County, affecting lands within the Eldorado National Forest.

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FOR EVERY PIT, MINE AND QUARRY
Easton Car and Construction Company
Easton, Penna.

HUG

The Unusual Job

THE Hug Roadbuilder will handle the unusual job with the same efficiency as the ordinary job because Hug Roadbuilder Trucks are designed specifically to meet roadbuilding conditions.

Roadbuilding trucks to pay a profit must operate with maximum efficiency under all conditions, and in building roads, travelling over unmade roads and delivering material at high speed, the conditions are unusually severe.

Hugs stand up on the job when you need them most. When the going is hard and transportation of material is essential, the Hug Roadbuilder keeps your plant in constant operation. Hug Performance has established Hug Reputation.

Complete details furnished on request.

THE HUG CO., Highland, Illinois

Allis-Chalmers
Monarch Tractors

Offer the lowest cost drawbar horsepower in their class.

ALLIS-CHALMERS MFG. CO.
Monarch Tractors Division SPRINGFIELD, ILL.
"75" — "50" — "35"

Model 140 *Service* Ditcher

Compactness and mobility are combined with characteristic Buckeye ruggedness in this chain-and-bucket type ditcher. Meeting exactly the peculiar requirements of service line excavation, it works to equal advantage in close quarters and also on smaller main trenches.

It places at the operator's ready command, through heavy-duty transmission controls, 3 road speeds, 3 bucket line speeds and 12 digging speeds. Six cutting widths range from 16 to 26 inches, and cutting depth is 9 feet. Oversize Twin Disc clutches, readily accessible, insure easy steering. Other profitable mechanical features include steel-tread Alligator (crawler) wheels; box girder boom with high-speed hoist; no under-cutting of Alligators; reversible teeth for buckets; power shifted and highly mounted reversible conveyor with 2 speeds; 52 h. p. medium speed, industrial type motor; and steel construction throughout.

Write for descriptive bulletin.

The Buckeye Traction Ditcher Co.
FINDLAY, OHIO

There's a Buckeye Sales and Service Office Near You

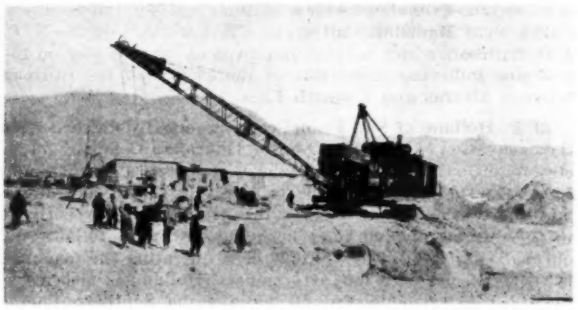
for over **Buckeye** *thirty years*

Irrigating the Loess Deserts of Turkestan

(Continued from page 279.)

Average output for one of the 50-B's shows 30,400 cubic meters (39,763 cubic yards) per month for 7 months, for the other 22,800 cubic meters (29,822 cubic yards) per month for the same period. This gives an average hourly output of about 71 and 61 cubic meters (93 and 80 cubic yards). In easy digging the output runs up to 120 cubic meters (157 cubic yards) per hour, in the hard clay it is but 35 to 40 cubic meters (46 to 52 cubic yards) per hour, and in the shingle and stones it is about 40 to 45 cubic meters (52 to 59 cubic yards).

Each machine has a crew of seven men per shift, one operator, one oiler, one fireman, and four pitmen. In addition to ordinary duties, the pitmen



Changing ropes on Bucyrus-Erie Class-14 which is cleaning up at the locks where the Dalverzinstroy Canal joins the Syr Daria. Note Thian Mountains in the background.

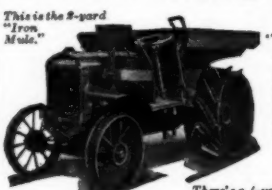
open a small canal which follows each of the machines to keep it supplied with water, the canals themselves being dug dry. Fuel is a residue oil called Mazout, and consumption for the 50-B's averages approximately 33 U. S. gallons per hour per machine. American Steel and Wire Company ropes were being used at the time of our visit, and

(Continued on page 312.)

Put An "IRON MULE" on the Job

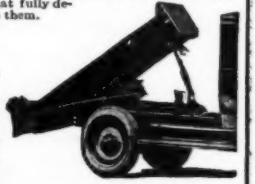
It Licks Trucks and Teams

This is the 2-yard "Iron Mule."



"IRON MULES" for years have made phenomenal profits for dirt-moving contractors. There are 2 sizes—the 4-yard with power hoist dump and crawler tracks, and the 2-yard with gravity dump. These sensational dirt haulers will get where trucks and teams can't go. Write for illustrated broadside that fully describes them.

There's a 4-yard with crawler tracks also.



Dump Bodies Too

HUGHES-KEENAN Dump Bodies for all makes of light trucks are famous wherever dump bodies are used. Made in 1 and 1½ yard sizes, equipped with gravity dump, underbody hand hoist or power hoist. Write for descriptive folder.

THE HUGHES-KEENAN CO. Mansfield, Ohio

Electric shovel loading cars in open-pit iron mine, Hibbing, Minnesota.

Electric shovel in rock quarry, Bonner Springs, Kansas

A Tireless Arm and a Powerful Jaw --*Electrically Driven*

A RAPID swing, a smooth halt, jutting jaws gape, and then the swing back. The tireless arm thrusts, the jaw bites. A hoist—and the outfit again swings swiftly to load waiting ore cars.

Each operation in the cycle: swing, thrust, and hoist, is performed with day-after-day dependability by the aid of electric drive. Its advantages: smoothness, rapidity in operation, low maintenance cost, and long useful life, are known to operators of shovels equipped with G-E Motorized Power. Ward-Leonard control enables nicety of manipulation.

In every size from 1 1/2 to 16 yards, wherever a shovel is needed, G-E Motorized Power, behind the bucket, efficiently and abundantly furnishes driving power for electric shovels. For d tailed information, call your local General Electric Office, or address the General Electric Company, Schenectady, N. Y.

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200-334

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Irrigating the Loess Deserts of Turkestan

(Continued from page 310.)

were giving from 30 to 99 shifts service. Ropes were being kept oiled, possibly an inadvisable practice considering the extreme dust handicap. Machines are cleaned down and boilers cleaned out once a week. Once a shift, boilers are blown down. As the water is none too good and often very alkaline, particularly when trench has been recently extended through new ground, it is difficult to keep the tubes in good condition.

The narrow canals are dug behind the machines, dirt being cast to the side. On the wider canals, as the machines are not working together, it was found best to dig one side with a narrow cut just sufficient to get the slope clear on one side and then return with a second cut to finish the canal.

Draglines with Long Service Records on Job

Built back in 1916, the Bucyrus-Erie Class-7, with Johnston boiler, is an old-timer. It has been overhauled and equipped with wooden shoes on the caterpillar-type mountings.

The Bucyrus-Erie Class-14 dates back to 1913. It has a Johnston boiler, and is equipped with a 60-foot boom and 2-yard bucket. Originally it was supplied for mounting on a pontoon, but has been changed over to mounting on non-propelled truck from some other machine.

The machine had just completed a section of the lower portion of the main delivery canal and was cleaning up around the lock where this canal joins the Syr Daria at the time of our visit. This section of canal 1½ kilometers (.93 miles) long is 10 meters (32.8 feet) deep and 6½ meters (21.32 feet) wide at the bottom. 3½ meters (11.38 feet) up there is a berm of 2 meters (6.56 feet) on each side. In this bottom section the slopes are 1 to 1½. The top section 6½ meters in depth has slopes of 1 to 1. This brings the top width of the canal to approximately 33 meters (105 feet).

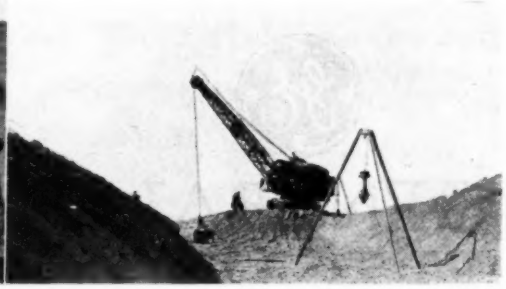
To dig this the Class-14 took two cuts. In places it was difficult with the reach of the machine to dispose of the spoil, and here an additional cut was made in the top soil to take the cast from the first cut. The top digging was in easy, sandy soil, with some fairly hard clay immediately beneath. In the bottom was shingle, with imbedded stones and boulders running as large as a man's head. In places conglomerate was encountered and required blasting.

Output ran as high as 28,101 cubic meters (36,756 cubic yards) per month on a three 8-hour shift schedule of 25 days per month. When there were no delays the production averaged from 60 to 70 cubic meters per hour in the harder digging, and over 100 cubic meters (130.8 cubic yards) per hour in the loess and sand.

Oil consumption for the entire seven months of operation averaged 2.35 kgs. per cubic meter excavated.

Supplies and fuel oil is carried to the machines over an industrial narrow gauge railway over which a converted Fordson hauls light flat cars carrying various materials required. This railroad extends through the entire workings and gives very good service. Oil and supplies are hauled by horse-drawn carts from the railroad to machines.

The entire operation is well organized, and considering the tremendous handicaps to be met because of location, climate, and physical difficulties, sincere tribute must be paid to the able engineers who have the work in charge and to the Russian operators at the levers of the machines as well as their assistants. The work is receiving intelligent and active support from the government officials of the Republic of Turkestan and also of the Soviet authorities at Moscow. Immediate results in rich crops from this territory are assured, and will be vastly multiplied as the tremendous program continues with increasing momentum.



(1) Making the second cut with one of the Bucyrus-Erie 50-B's on a section of the Dalverzinstroy Canal.
(2) A Uzbeck at Namangan. Note cotton underlined coat and extra coat under his arm to protect him against extreme cold of the desert night.
(3) Another view of the 50-B on the second cut. Note the clean slope of the canal. In the foreground is one of the kerosene lamps, suspended from the tripod, used for night operation.